ARCHITECTURE

VOLUME LXV APRIL 1932 NUMBER 4

Prefabrication and the Small House

By W. H. Ham, C.E.

It is difficult to discuss relativity without mentioning Einstein; it is difficult to discuss housing without mentioning William H. Ham. As director of the Bridgeport Housing Company, he has been working at his problem since before the war, and he is working at it to-day. Few men have had his opportunities of learning what sort of homes people want and how to produce them. You will read here no mere imaginings of a theorist; here is an authenticated vision of to-morrow.

—EDITOR.

I AM committed, after ten years of study, fundamentally and absolutely to the belief that we can prefabricate 90 per cent of a house in the factory, assemble it, and make it a permanent, attractive, useful home. We know now enough about our requirements so that we need not make great errors in decision as to what type, size, or kind to build, and we have a sufficient history in our own national life to guide us in the selection of styles to be safe for a long-time investment.

We must pay our institutions which assemble and guard the money of those who save a fair return on the use of this money. If we are wise and careful of the future of our investments, we must set aside each year a fund to take care of depreciation, obsolescence, and other items unforeseen.

Roughly stated to-day, this means the bonds must pay an interest of 6 per cent. The more risky portion of the investment can be found in quantity at 8 per cent, and assurance against depreciation, obsolescence, and other items threatening our future investment ought to be at about 2 per cent of the cost of the structure.

I present specifications of these items, each of which is a fundamental part of the economics of the problem:

(1) Every home shall have a front and back door independent of every other home.

(2) Every home shall have a yard of its own.

(3) Every window shall let in sunlight every day.

(4) No design shall be used in creating these homes which has not had a precedent satisfactory from the standpoint of art and structure for the last one hundred years in America.

With these specifications we ought to proceed immediately to the analysis of the problem; find out what we can prefabricate and how we can do it; what we shall pay these men and women who work in the prefabricating shops; what form of working conditions they shall have so as to make them happy in their work.

If we do this, we shall find that men and women, working under the conditions which can be developed in the prefabricating shops and in the transportation and erecting departments, will have a continuity of work of proper division among those qualified for the right kind of a job, and be free from seasonal shutdowns. They will be perfectly satisfied with their wage, about one-half the hourly rate paid to the vagabond mechanics who build the house to-day, and about equal to the average annual wage received by these same vagabond mechanics.

I am very sure that these workers will produce, with their machines and their scheduling, at least double the amount of work per person that the vagabond mechanic, in his honest effort to produce, can actually deliver.

I believe, after long years of experience in the handling of materials for homes, that we will save not less than one-third of the material and produce a better home. I believe also that in this way we can ask and receive beauty from the trained architect and incorporate his ideas and his details in these prefabricated units far cheaper than we could do to-day, even in the

least expensive form of his co-operation with the builder using the vagabond mechanics.

This is so important that I want to illustrate. Very few homes have been created in America in the last one hundred years which have become at all important from the standpoint of art, except those truthfully copied or carefully developed from the earlier craftsman's homes built along the Atlantic seaboard, and those built following the Spanish influence in Florida and California. The architect knows this full well. He has struggled to create a new design for this day and age and call it an American home type of architecture; but he has not succeeded.

The best of those who make the small home have gone back to our early Dutch, our early English and French types of homes and have developed these in so much better ways than our forefathers ever did at their best that we have to-day before us these wonderful creations of simple, straightforward, truthful ways of building the small home.

An influence which perhaps ought also to be added is that of the Greek Revival, which occurred about 1830 and which came to us through France from Athens, direct from the Acropolis, after being buried a thousand years or more. We have done a little in Italian and Spanish revivals, but not much. In the last ten years we have changed styles at least three times in our commercially developed, unstudied real-estate developments.

Carrying the illustration farther: Every architect knows that proportions, fenestration, mouldings must, in the successful house, be dictated by the trained man, and I would not be party to any prefabrication programme that did not give him all of these, and more, to design within bounds of economy, and stamp this home with the beauty that he has learned how to impart.

Let us go directly to the problem now and see what we can prefabricate in a shop that is arranged for this kind of work. We will list the items one by one, and comment briefly on them as to materials and methods. Later we shall write the specifications for each item with the

A characteristic view of Seaside Village, Bridgeport, Conn., designed by R. Clipston Sturgis and A. H. Hepburn, and built under Mr. Ham's direction

Mr. Ham is a firm believer in building houses of a style that is fixed by at least one hundred years of acceptance. This is another view in Seaside Village; R. Clipston Sturgis and A. H. Hepburn, architects

most meticulous care, yet with elasticity that will allow the man with the artistic touch to enter into the problem, the manufacturer with vision to come in and endeavor to make better materials and invent better methods of handling these materials, to get the result that we want.

As we divide our house up we find the following: foundations, walls, partitions, floors, ceilings, roofs, windows, doors, chimney, hearths, stairs, closets, dormers, cornices, gutters, etc. If the house is properly designed we shall find all of these bearing certain relations each to the other and to many more items which have been omitted in this brief list.

We shall also find some characteristics which make the house salable, such as color, materials that are indigenous, details that are strongly established by local custom or type, and some simple tricks of mechanics. To illustrate: Many a bad house, with cheap lumber and bad plaster, has been sold because of a clever folding ironing-board that cost $9. We must not forget these appeals to the housewife. The architect usually forgets them; the speculative builder does not. Let us start, then, to build the house by the fabricating process.

1. Excavation by machine, removing the dirt entirely from the site, except that needed for back-filling around foundations and for filling foundation blocks.

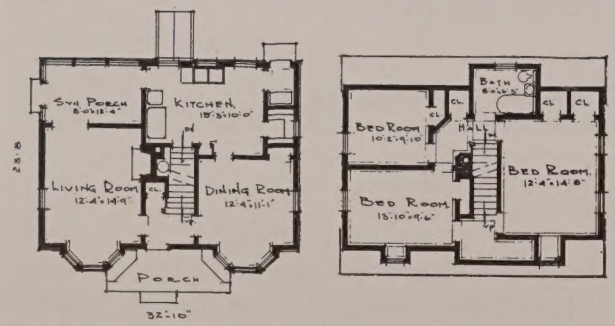
2. Footing blocks for walls, chimneys, and columns to be precast of required size and thickness.

3. Foundation walls to be cast as hollow shells with walls of concrete about 2 in. thick, made so as to be keyed together with a poured wet mixture of fine-aggregate concrete, to be anchored to the foundation blocks below; these hollow shells to be filled with dirt from the excavation. Every movement to be made with machine, including the tamping of the dirt.

4. Footing blocks for chimneys and piers, the same.

5. Chimney to be complete from footing to the top of the roof; one piece, with openings as

A design for a six-room house which Mr. Ham has built several times. It was designed by Shaw & Hepburn, architects



needed for (*a*) heating plant, (*b*) fireplace, (*c*) incinerator, if desired. Other openings as required.

6. Bulkhead, stairs, and roof over bulkhead to be one piece, set as a part of the foundation with derrick. This ought to weigh about two tons.

7. Floor of the living-room and ceiling underneath entirely finished and placed as one piece. (For the workingman's home this need not be over 12 by 18 ft.) This can be transported after fabricating at shop. Insulating material should be used for the cellar ceiling. Beams should be exposed and a hardwood floor of oak should be the surface finish of the living-room floor. It should be treated with oil of the proper kind, rubbed in and rubbed smooth. Floor boards should be very thin and should be thoroughly impregnated, so that they will not warp, shrink, twist, turn, or absorb. They should be polished by machine so that the finish is permanent and in the wood and not on the surface material. (Water will not hurt these floors.) (House to be erected under a tent.)

8. Floor of another room: Same as above, but smaller in size. Floor of the kitchen, same, but finished with linoleum, cork, rubber, bakelite, or one of fifty other materials suited to kitchen floors.

9. Any other floors on the first story, same as above, using wood.

10. Partition walls between rooms on the first floor to have doors and other openings entirely and completely prefabricated and installed, using 2-inch thresholds settled into the spaces left for them for the stiffening member at bottom of the door frame. Outside of the door frame, within the partition, will be diagonal braces to hold the frame accurately in position. These partitions are completely finished, ready for the family to hang its pictures; no further surface treatment being required.

For these partitions there may be used some of the plaster boards suited to this work. A few of the manufacturers of plaster boards are equipped with apparatus so that they can ship them in full-size pieces: from end to end of partition and from floor to ceiling, one piece, eliminating the joints. These should, in the prefabrication, be applied to both sides of the partitions, the first thickness being thoroughly nailed to the trussed studding and the second, or finished, coat to be glued to the first and pressed into position so as to be flat, smooth, finished, and decorated. This must be done on the work-table in the shop for economy, all edges to be finished with proper protecting mouldings which, when erected in place, will become a part of (*a*) the base moulding, (*b*) the cornice moulding, and (*c*) corner mouldings. The balance of the mouldings, such as the base, are to be applied after erection of the partition and after the partitions and the floors are bolted together.

11. Outside walls to be finished waterproof on the outside and like the partitions on the inside; made in the shop with all windows, shutters, glass, screens, etc., installed ready for use. All windows to be weather-stripped in the shop. Painting and decorating finished, except outside surface which is to be later veneered, either with brick, cement, slate, shingles, stone, clapboards; anything that fits a house of this character. These exterior finishes should, together with the locations and sizes of the open-

ings, and details of the cornices, be dictated by the architect.

The house can be occupied before the veneer is applied, because it will be waterproof and thoroughly insulated, thus leaving to a proper season the erecting of the outer shell. (If brick is used, this will require approximately seven thousand average size brick.) I think we shall go farther and cut this in two by using a larger size brick, half as thick and better made.

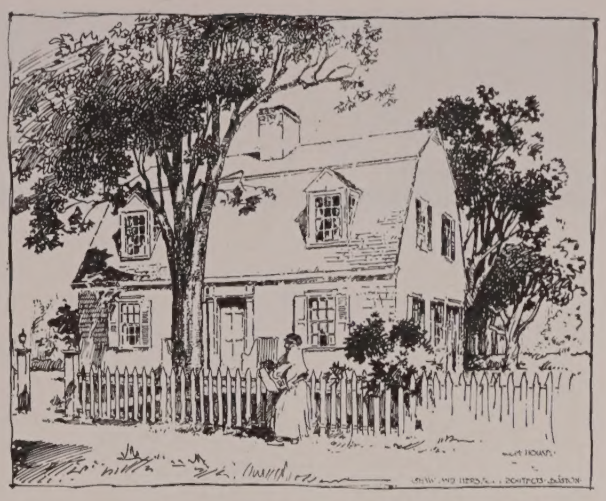
12. The floor above the living-room with the ceiling complete, preferably a beam ceiling for convenience of construction, durability, and easy repairs in the future; true, honest and strong, just the same as the ceilings in hundreds of houses in New England have been found to be constructed when we take off the plaster later applied by some one who wanted to be modern.

If a flat ceiling, smooth finish, is desired, it can be created with a two-process method, using a form of fibrous paper or cloth the full width of the room. Apply this after the insulating boards, which make the ceiling proper, are applied to the trussed timber frame of the floor itself. The finished floor on top of this member should be finished as the living-room floor was finished, impregnated with oil and rubbed until it is as smooth as desirable. Other floors and ceilings for other rooms are to be created the same way until we come to the bathroom.

13. The bathroom ought to be a one-piece unit, built like an elevator cage, strong enough to hang on a hook. It should be equipped with all its fixtures and with three pipes—soil pipe, hot-water pipe, and cold-water pipe—projecting through to connect to the vertical lines in the walls underneath by special connectors at the cornice line of the ceiling of the room below; all pipes extend through the ceiling of the bathroom to connect to such vertical pipes as are needed above.

Floor of the bathroom can be waterproof with one-piece member of linoleum, rubber tile, or cement with proper ceramics. Walls can be of cement and asbestos or micarta, and should be finished from floor to ceiling with waterproof material. Bathroom ceiling as well should be waterproof.

14. The roof, in sections of proper length—approximately about one-third the length of the house—should be built complete with slate, shingles, metal, or other waterproof surface applied in the factory, leaving the joints between sections to be filled in with the same kind of



Another one of Mr. Ham's favorites is this six-room house with gambrel roof, with plans differing only slightly from those on the opposite page. Shaw & Hepburn, architects

material after the roof pieces have been erected. (All roofs should be insulated against the weather.)

15. The small ceiling in the second story should be complete and set into place on temporary supports until the roof is installed and the collar beams can be anchored; supports then to be removed and the connecting cornices, corner mouldings, and base mouldings installed.

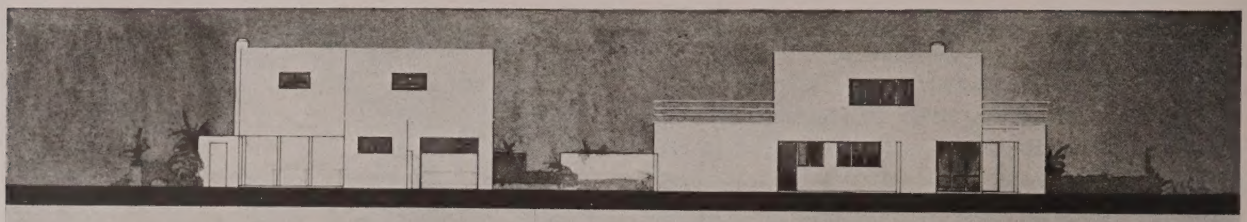
16. Stairs, complete, from first to second story, and from first story to cellar should be delivered completely prefabricated ready for installation as one piece, at the proper time.

17. Closets throughout the house should be fabricated ready to set in position, either as free-standing closets or built-in closets.

18. On top of the roof, dormers should be prefabricated, complete, and secured to the roof members by angle clips under the flashing, which is part of the dormer, before the final roof-covering members are applied.

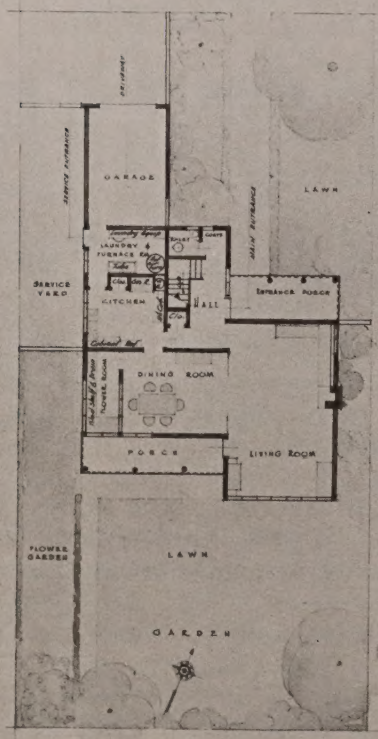
19. Front porch floor and steps together to be prefabricated, one piece. Side walls of the porch, the same.

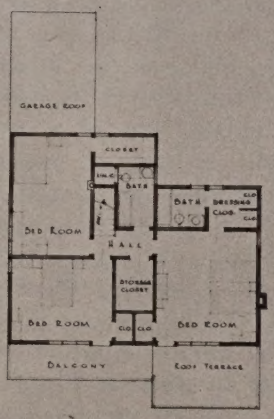
20. Cornices, full-length members, to be



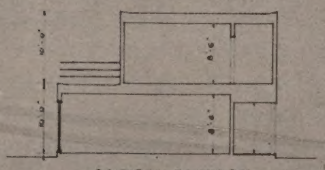
A HOUSE OF MODERN MATERIALS

FACTORY FABRICATED, PANEL-UNIT WALLS ON STEEL FRAME. BASEMENT OPTIONAL BUT UNNECESSARY IN THIS PLAN AS THE HEATING IS BY AUTOMATIC GAS-FIRED, WATER-CONDITIONED, HOT-AIR FURNACE. KITCHEN, LAUNDRY & FURNACE ROOM ARE PLANNED TO CONSTITUTE THE MECHANICAL-OR WORK-UNIT OF THE HOUSE ...
TIME OF ERECTION - 10 DAYS ..
COST SHOULD NOT EXCEED $3000. ...

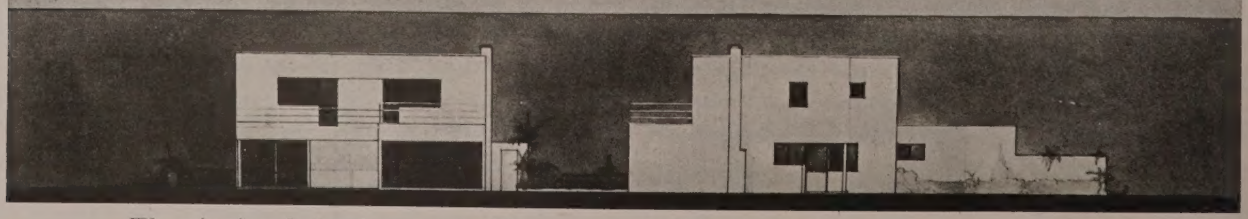




·SECOND·FLOOR·PLAN·



·BLOCK·SECTION·



The winning design in a competition recently held by the Architects' Emergency Committee of New York, for unemployed architectural draftsmen, to secure a design suitable for mass production. S. Clements Horsley, architect

There is no reason whatever why a dormer window cannot be made in the mill in quantities, shipped to the house, and bolted in place on the roof, as Mr. Ham here proves at Rippowan Village

prefabricated, erected by derrick and bolted on. Covering mouldings only to be applied separately.

21. Gutters to be included in the cornice. Down-spouts where needed to be erected as one piece.

22. Garage is to be erected in the same way that the building is, or prefabricated and erected as a separate unit with single-piece members for side walls, four in number for each stall, and one-piece roof member for each stall. Floor probably precast in the factory and delivered whole.

23. Sidewalks, driveways, curbs to be precast at the factory and delivered whole in large sections, about two-ton sizes.

24. Heating unit, using oil, gas, or electricity, to be installed as one mechanism, connected to the required members already installed in the partitions and in the floors. Transmit the heat by either warm air, hot water, or steam as required. (Coal may be used in the same way with a different form of burner.)

25. Fireplace for living-room can be made as one piece with the hearth and erected with the derrick at the same time the living-room floor is erected.

Many other items, not suggested above, can be prefabricated.

Let us have the general specifications for the materials for these fabricated elements:

Outside walls are to keep out the weather, to look well, to be permanent, to be easily maintained; and to be of materials, where possible, indigenous to the community in which they are used. This outer surface may well be applied after the structure has been finished, so as to pass over into the proper season of the year these processes which need to be governed by natural conditions of climate and weather.

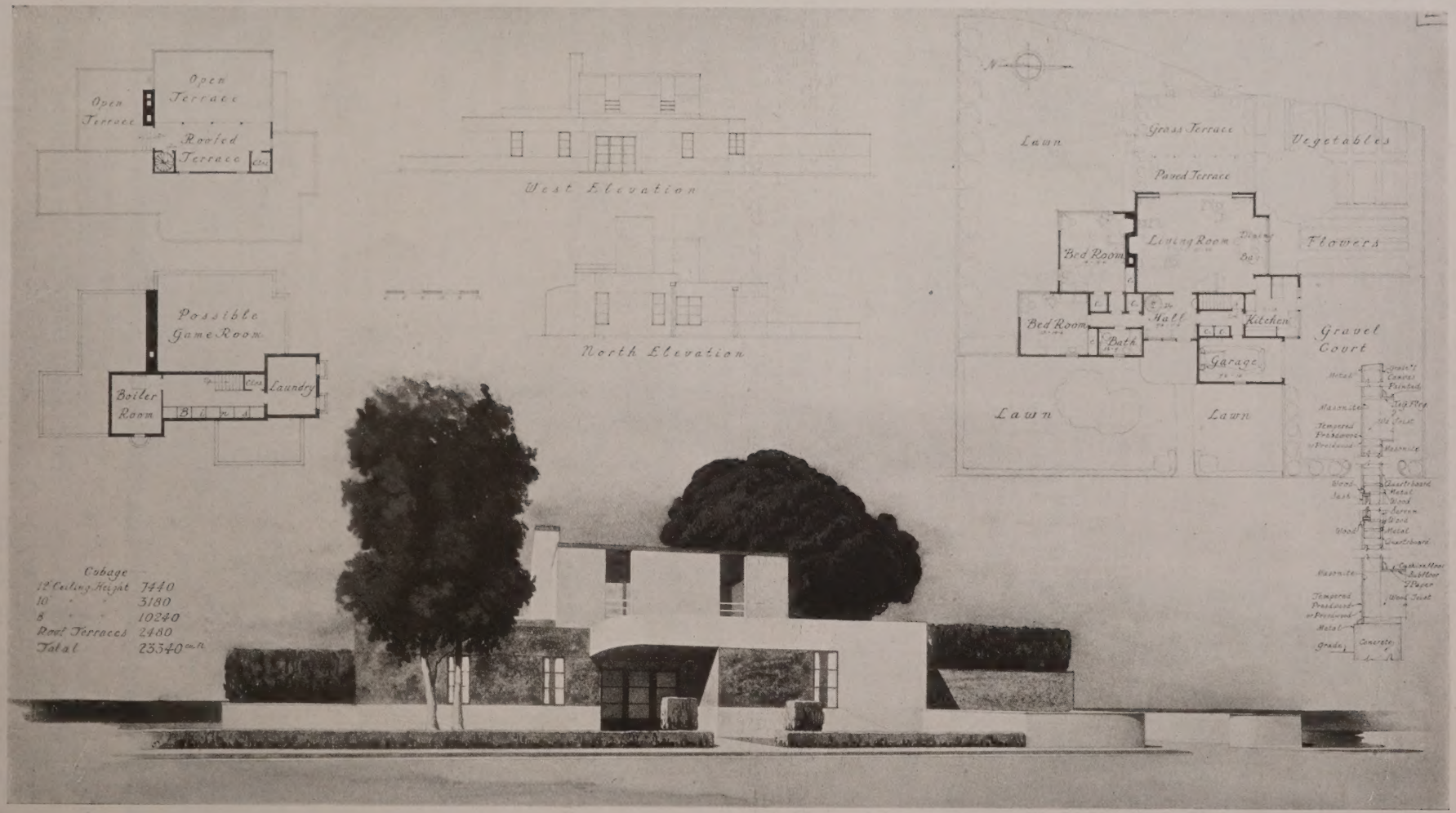
The openings in these exterior walls must be proportioned to be harmonious with the wall; and, as outlined above, the building must be so oriented that the windows will let in sunlight every day.

The partitions between the room units of the house must be built to perform their function, which is to separate parts of the house; and must be impenetrable to sight, sound, and the transmission of heat.

These partitions and these inner surfaces of outside walls must be lived with by the human family, and must be so created that they can be damaged and renewed and be as good as new after repairs. Materials that will give these results can be and are being used to-day. To a less degree they are important in the ceilings and floors, so that they may have all of these characteristics, namely, soundproofness, heat-insulating properties, durability, and capability of being repaired like new at small expense.

These surfaces must be such that dust, with its accompanying difficulties, and dirt, with its depressing results, can be eliminated easily, and wear and tear be reduced to a minimum.

The roof of our home should be thoroughly



Under the auspices of the Chicago Chapter, A. I. A., a competition was recently held for the design of a five-room bungalow to be built in the Housing Exhibit of the World's Fair—the competition sponsored by the Masonite Corporation. Here is the first-prize design, by Frazier & Raftery. It is said that the bungalow with its one-car garage can be duplicated at a cost of from six to nine thousand dollars. Parts of the exterior are faced with a composition board having natural wood face, other parts with the same board painted white

waterproof, heatproof, non-reverberating, desirable as to exterior appearance as economy warrants, and renewable, without injury, when outer surface has been worn out, without damage to the design of the building.

Other items of our specifications as to the materials: Since we began to bathe regularly, not many years ago, we have created a tremendous interest in the use of water. This interest in our cleanliness should be properly supported by equipment satisfactorily complete and workable, designed in its relation to the other elements of the house so as to give results which will be satisfactory from the standpoint of appearance, durability as to fixtures, and proper damp-proofing of surfaces within the rooms that contain these water fixtures. That is to say, bathrooms, toilets, kitchens, and pantries should have waterproof floors, waterproof walls where possible, and at least damp-proof ceilings. This is a simple specification.

Fortunately, in the year of 1932 many manufacturers have proceeded far in advance of the architects, engineers and builders, and have prepared many items which are now being used in a limited way. Some have forced their way into universal markets and many of these possess the properties that we need to satisfy these general specifications and the detailed ones which are to follow, and enable us to prefabricate.

The first great revolution in the house-building art since the time of Nero was the introduction of a substitute for plaster, unless we say that the glorification of the bathroom constituted a revolutionary change. But structurally, and from the standpoint of prefabrication, plaster as applied by the plasterers of Pericles, those of Nero and Henry VIII, down to ten years ago, prohibited any advanced thought along the line of prefabrication which would create economies worth while.

Then we developed the substitutes for plaster in large-size units, and these materials have been progressing by leaps and bounds; they have created their own markets and are almost universally in demand to-day in every city, in every village, hamlet, and isolated farm home.

They can be bought in large sizes of desirable quality, wonderfully useful, and in various types to meet the requirements of our needs and our tastes. They can be prefabricated, with other members, as a finished product, and furnish beauty, harmony, and strength. With these we are ready to revolutionize our building programme.

They are so many that we need have no fear of any one dictating the direction in which we shall go. For illustration: A building is now being created in Boston using aluminum sheets on the outside; aluminum window frames; and on the inside, plaster substitutes, so that the whole panel is made in the shop, transported on a truck, erected with a derrick, and bolted to its supporting members which are covered with properly detailed mouldings in harmony with the design.

This is a revolution as great as the revolution in steel structures, where the skeleton preceded the masonry. In our small home for which we are planning a prefabrication process, we have many materials. A few of them are Celotex, Asbestolith, Insulite, Homasote, Gypsolite, Bestwall, and Sheetrock. These can be metal-covered for exterior; they can be printed upon for decoration; painted, impregnated, or plastered with a flexible coat, extremely thin and very durable. The plaster substitutes are here and ready for use.

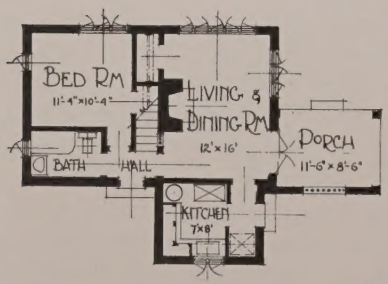
The next question, after the decision to use a substitute for plaster, is how to develop frames of our large-size house members, such as walls, partitions, floors, with their ceilings attached, so that they will stand the rack and stress and strain of handling in the prefabrication shop, storing for future use, loading upon transportation conveyances, being unloaded, and erected.

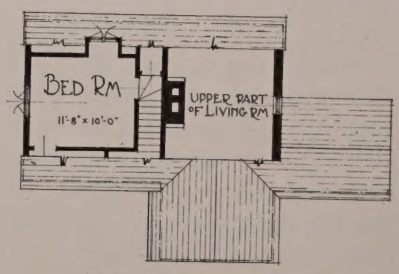
They must be so designed that they can be anchored strongly to other members, likewise prefabricated, and they must be accurately sized and properly edged. For we see with discomfort any errors at the edges, especially at the cornice, as well as in the middle.

These errors must be eliminated, which is easily done by covering with harmonious mouldings. The members must be handled with proper machines; they must be packed so as not to be damaged in transit.

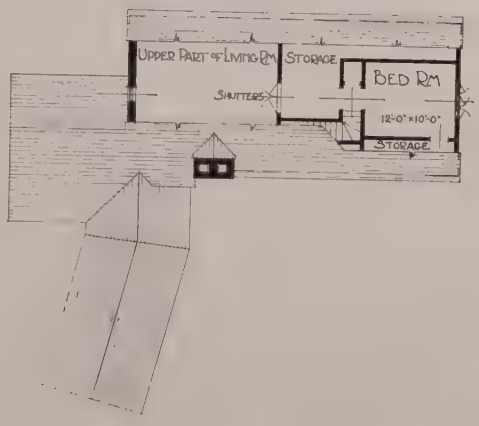
They must be erected under a tent of some kind, so that the finished surfaces, which will not stand rain or snow, can be put together without being damaged. They must be of such material that, if they are damaged, the surface can be renewed and be as good as new; the same as new in appearance. This is a very important item.

A cottage at Cohasset, Mass., built for the late Mrs. Frederic Cunningham by Constantin A. Pertzoff, architect. The cost of the building proper, without driveways, grading, and clearing of woods in the two-acre plot, was $4,490. Concrete blocks are used for the walls with natural wood siding on the gable ends, and a shingle roof. The architect's conviction is that by careful planning, a rigid simplicity, and use of prefabricated materials, the cost of a pleasing and durable house can be brought much below our present cost levels. Group construction is a major source of economy





A somewhat larger cottage built at Cohasset, Mass., for the late Mrs. Frederic Cunningham. It was built at the same time as the one shown on the facing page, and, with its heating system, is adapted for year-round use. Mr. Pertzoff succeeded in building this one, exclusive of grading, clearing woods, building drives, etc., for $7,590



Here is one of the living-rooms in which Mr. Ham has used wall board without plaster. He runs his lengths horizontally, covering the joints with a cornice moulding, a low picture moulding, a chair rail, and the baseboard. The greatest difficulty, of course, is a vertical junction at a projecting angle, which he solves with a special corner moulding

Let me illustrate: Plastering by the old-fashioned method with color in the mortar is very much cheaper than plastering in the natural color; then waiting until these plasters dry, lose their alkalinity, and become proper surfaces on which to paint. The difficulty is that these surfaces are often damaged in construction and installation of equipment, and it is very difficult to renew or patch these scars and damaged places to make them like the other undamaged portions of the wall. Every builder knows this. Probably that is the reason the colored mortars are not used much. They are very economical. But we must design our prefabricated unit, which is susceptible to accidents, so that it can be renewed—and this can be done.

A fundamental necessity is that it shall be smooth and that it shall be impregnated with a flexible material which hardens sufficiently to be free from the difficulties of over-softness, but never hardens until it is brittle and cracks. We have many materials of this kind to-day which can be applied to the surface of these substitutes for plaster, if they are smooth.

Let me illustrate again with Celotex. If a piece of Celotex, with its natural surface, is damaged, it is almost impossible to renew the damaged area without its showing; whereas if this Celotex is sanded, as we would sand the surface of a piece of lumber, it is very easy to renew, either with paint, lacquer, or other impregnated flexibles well suited to this work. In the same way, hard plaster, when it is smooth, can be renewed and the injury made to disappear, using proper materials.

Let us go on with the prefabrication requirements. Definite planning of our work in advance; absolute dimensioning of all members; using such structural members as can be dimensioned properly, permanently, and furnish the required strength—not too much strength, as is usually found because of commercial sizes, but proper strength for all of the stresses that come to these structural members. When we analyze these with engineering accuracy we shall find that we can save tremendously in the structural design of common house members.

Let me illustrate by a building which I rebuilt, using for a span of 17 ft., 6 by 13 in. timbers, doubled, and spaced with only 12 in. between, expecting therefore to have a stiff and rigid floor. But when this was completed and before the ceiling was put on, I was horribly disappointed at the shaking of these timbers; vibration with only human loads. Through the sagacity of a carpenter, this floor was made absolutely rigid by the introduction of just a few diagonal braces. From that day to this I have emphasized in all my recommendations in connection with structures which are to take stress the proper use of diagonals.

All partition frames should be diagonally braced, so as to keep the doors rigid, and, in the outer walls, windows rigid, in place and plumb; so as to obviate the tremendous amount of cracks which are due to wind stresses and sun stresses in these buildings.

There are many other things in connection with the design of buildings, their equipment, and the facilities which change from year to year, but there is no useful feature which we want to install which does not lend itself to improvement through proper study by the engineer and architect, and which cannot be properly designed so as to become a part of this revolution in the building method.

Summarizing very briefly the whole problem of our home for the great average group of our people, it should be designed to suit the varying needs of life; youth with its small earnings and small family; proceeding to more income, larger responsibilities and increased family needs; earning more, investing more, having more.

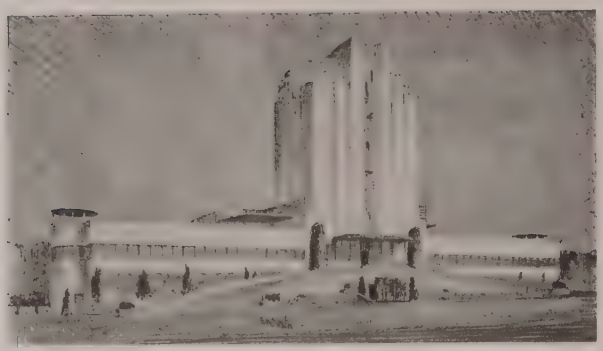
The financial structure should be set up to follow this need, keeping throughout to sound economic lines, not charity, not government ownership, not tax exemption. A construction method is needed to take the dream of the architect into the laboratory; with the engineer's precise, analytical method to subdivide the parts of this structure into large-size workable units suited to the materials of to-day, the transportation and machine equipment of to-day; to introduce economies that make it possible to meet the requirements of the great number of employees in our industrial, mercantile, and professional life; to furnish a better product, with better satisfied working men and women, producing the product at a cost far below that of the handwrought product of to-day.

The city man will say, perhaps, that this cannot be done in the large metropolitan areas and in the large buildings. To those who do not believe that it can be done, I want to say that it has been done, though with different materials, in every single item which I have outlined, with the exception of the bathroom. The bathroom apparently has not yet been prefabricated for houses, though it has been done for ships.

There seem to be only two questions of right and wrong in the whole proposition. First, is it right that our young married people should have a home? Second, is it right that working men and women who build these homes should have the opportunity to use machine processes in a machine age and work under the conditions of industry, rather than to maintain their mediæval crafts in the vagabondry of to-day's methods?

The answer to both of these is the same: if we can make this boy and this girl happy, we ought to do so, provided that the men and the women who prefabricate these buildings are happy when they are doing it.

Rippowan Village, in which roads were twisted to save the old trees. Here are housing units of three, four, and five rooms. The village was designed by Mr. Ham, A. H. Hepburn, architect, and Arthur Shurcliff, landscape architect



Preliminary perspective of the proposed Sears Roebuck Building for the World's Fair in Chicago. Nimmons, Carr & Wright, architects

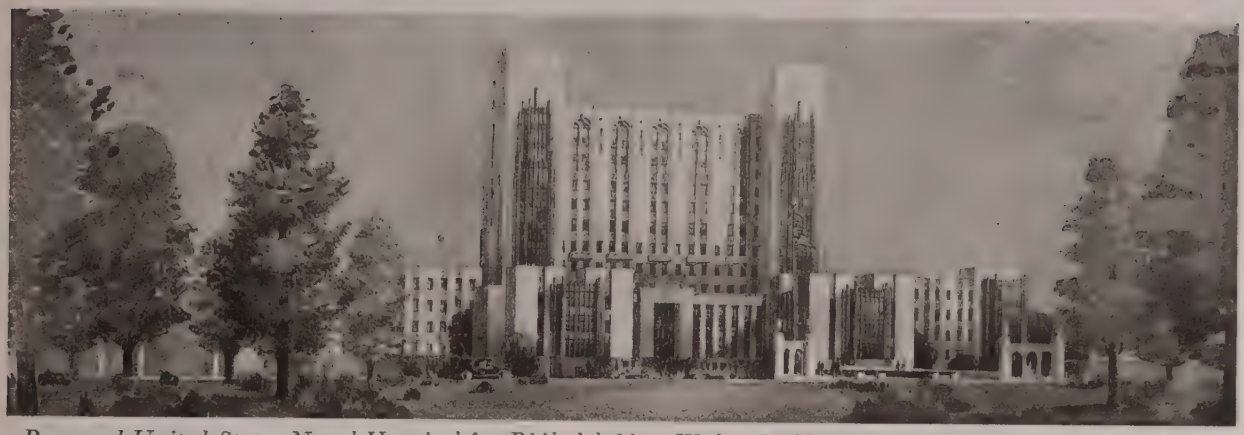
Preliminary perspective of the proposed Bronx County Jail, New York City. Max Hausler & Joseph H. Freedlander, associate architects

Architectural News in Photographs

Preliminary perspective of the Archives Building, to be erected by the Federal Government in Washington as part of the Triangle Development. Office of John Russell Pope, architect; Office of the Supervising Architect, Treasury Department, collaborating

The Joseph Urban show in The Architectural League of New York's exhibition room. The lighting is above a cheesecloth ceiling on wires

The Tavern Club of Chicago has recently remodelled its rooms. Among the new features is the wall decoration painted by John W. Norton



Proposed United States Naval Hospital for Philadelphia. Walter T. Karcher & Livingston Smith, architects

A window recently unveiled in St. Thomas's, New York City, as a tribute to Dr. T. Tertius Noble, organist. Designed and executed by James Powell & Son, Ltd.

Limestone following the cast aluminum spandrels up the steel frame. Rockefeller Centre, New York City

Cathedral of Learning, Pittsburgh, is nearing completion. Charles Z. Klauder, architect

The U. S. Appraisers Stores for Chicago. Burnham Brothers, Inc., and Nimmons, Carr & Wright

Illinois Bell Telephone Co. Building, West Monroe Street, Chicago. Holabird & Root, architects

BOOK REVIEWS

DUTCHESS COUNTY DOORWAYS AND OTHER EXAMPLES OF PERIOD WORK IN WOOD, 1730–1830. By Helen Wilkinson Reynolds. 280 pages, 8½ by 11 inches. New York: 1931: William Farquhar Payson. $22.50.

This volume supplements the author's "Dutch Houses in the Hudson Valley Before 1776," sponsored by the Holland Society of New York, which was published in 1930. The present volume tells of the homes in Dutchess County, N. Y., belonging in the century between 1730 and 1830. In addition to the "accounts of houses, places and people," the two hundred and four plates form an excellent record of the woodwork in detail, both inside and out.

A HISTORY OF ARCHITECTURE ON THE COMPARATIVE METHOD. By Sir Banister Fletcher. 1033 pages, 6¼ by 9½ inches. Illustrations from drawings and photographs. Printed in Great Britain. New York: 1931: Charles Scribner's Sons. $12.

Sir Banister Fletcher's great work has become so widely known that it is but necessary to say that this is the ninth edition, revised and enlarged, containing about 4,000 illustrations.

FARMSTEAD DEVELOPMENT. A Series of Bulletins Outlining Iowa Farmstead Planning for Utility, Profit, Health and Enjoyment. Prepared by the Department of Landscape Architecture, Iowa State College. 44 pages, 7½ by 10½ inches. Illustrations from maps, photographs, and diagrams. Pamphlet binding. Ames, Iowa: 1931: Extension Service, Iowa State College. 10 cents.

APPLIED ARCHITECTURAL DRAWING. By Towne R. Abercrombie. 156 pages, 6¾ by 10 inches. Illustrations from drawings and photographs. Milwaukee: 1931: The Bruce Publishing Co. $2.

The author is instructor in drawing in the public-school system of Cincinnati. His book, prepared for the student, and unlike most books on the subject, devotes itself largely to the methods, forms, and symbols used in working drawings.

PERSPECTIVE IN DRAWING. By D. D. Sawer. Introduction by Allen W. Seaby. 60 pages, 5 by 7½ inches. Illustrations from drawings and photographs. Frontispiece in color. Printed in Great Britain. New York: 1931: Charles Scribner's Sons. $1.75.

Miss Sawer, who is art lecturer at the Diocesan Training College, Brighton, tells of perspective with the artist's needs in mind rather than the more elaborate technical needs of the architect. Excepting for elementary perspective methods, the author aims to inculcate in her reader a basic knowledge of perspective and an instinctive feeling for its proper expression in freehand drawing.

OUTLINES OF THE HISTORY OF ARCHITECTURE. Part I, Ancient Architecture (Revised and Enlarged). By Rexford Newcomb. 176 pages, 8¼ by 10½ inches. Illustrations from charts and maps. New York: 1931: John Wiley & Sons, Inc. $2.50.

Professor Newcomb has prepared these outlines, of which there are four parts, for use in his teaching at the University of Illinois. They represent a digest of illustrated lectures, and were prepared originally in mimeograph form to obviate the difficulty of taking notes in a darkened room.

WOOD–LIQUID RELATIONS. By L. F. Hawley. 34 pages. 5¾ by 9 inches. Illustrations from drawings and graphs. Technical Bulletin No. 248. Pamphlet binding. Washington: 1931: U. S. Department of Agriculture. 10 cents.

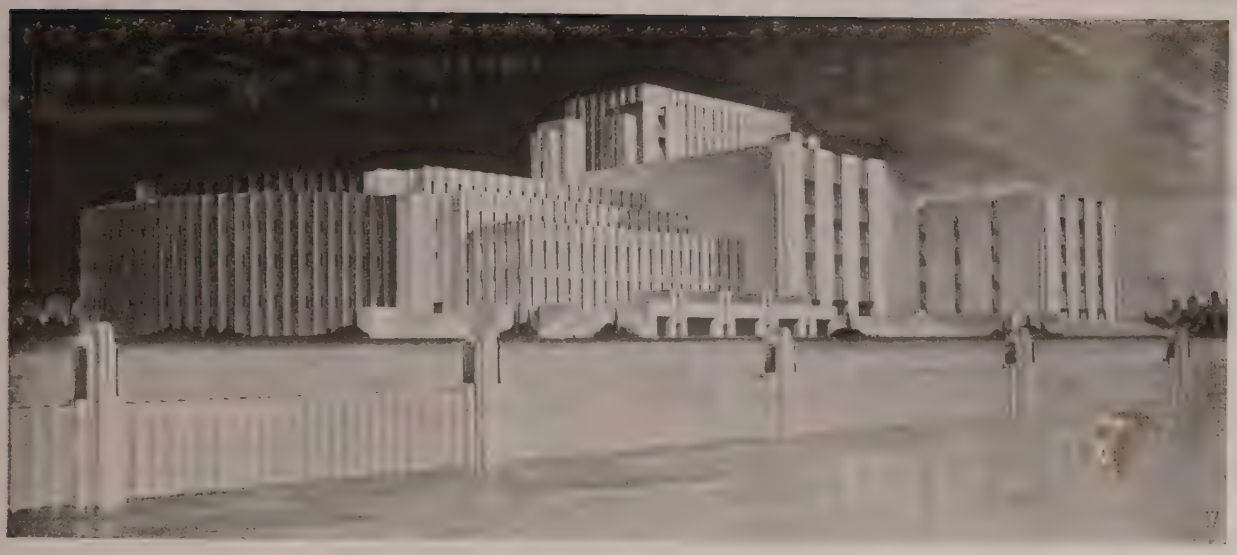
Examining the problems of impregnation and drying.

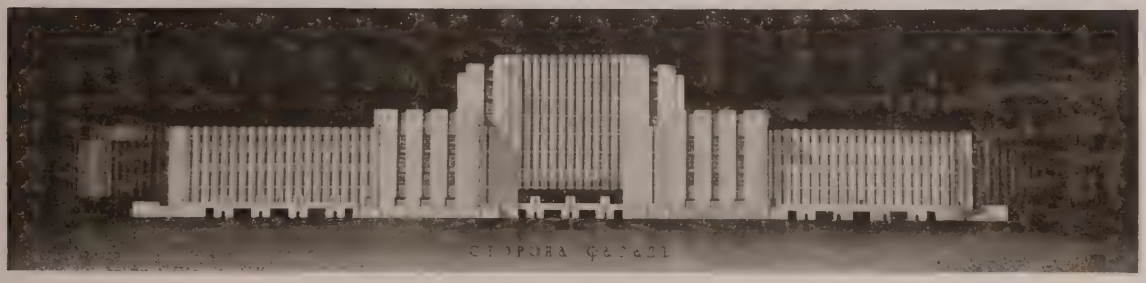
RECENT TRENDS IN AMERICAN HOUSING. By Edith Elmer Wood. 317 pages, 5½ by 7¾ inches. Illustrations from photographs. New York: 1931: The Macmillan Co. $3.

Dr. Wood deals with the question of housing as related to all of its component elements: health, morals, citizenship, happiness, supply and demand, income, and so on. She formulates lessons learned in our crude efforts of war housing, and brings to bear on the problem the experiences of European and other foreign countries before, during, and after the war. Dr. Wood has given us here a foundation work, on which doubtless many other volumes will arise in the near future.

PLANNING FOR SUNSHINE AND FRESH AIR. By Alfred Hopkins. 236 pages, 6¼ by 9½ inches. Illustrations from photographs and drawings. New York: 1931: Architectural Book Publishing Co., Inc. $5.

Alfred Hopkins is far more than an architect. His book is not to be included among the stereotyped volumes which contain dogmatic instructions from the man who insists that he knows and that what he knows you must learn. Mr. Hopkins is a philosopher mellowed by much travel and by much contact with human beings. His writing reflects both.



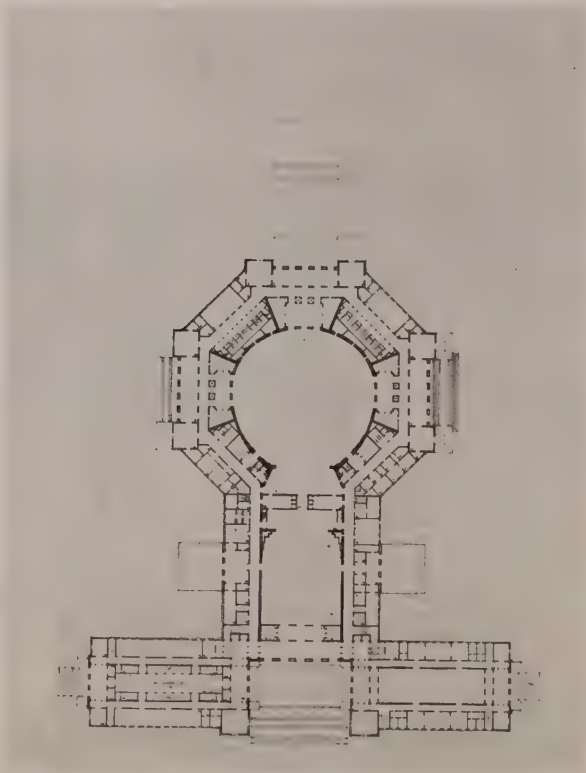


Above, perspective and front elevation of the design by Hector O. Hamilton, of New York City, which design shared one of three first prizes in the competition

The Palace of the Soviets, Moscow

The Palace of the Soviets, the name given the capitol of the Soviet Union in Moscow, will be one of the largest public buildings in the world. In addition to two main auditoriums seating 15,000 and 6,000 persons respectively, there are to be offices for government officials, diplomatic corps, and foreign press representatives; a huge library, a restaurant, and facilities for staging mass pageants, great concerts, and public demonstrations. The work is expected to take three years for completion

Perspective view of a portion of the design submitted by Joseph Urban, architect



Perspective, first-floor plan, and east elevation of the design submitted by Thomas Hibben, architect. Full details of the awards are not yet available. Two competitors who shared first honors with Mr. Hamilton are Russians. Alfred Kastner and Oscar Stonorov, of New York City, were awarded a second prize

The Problem of Ornament

IN TWO PARTS: PART ONE

By Claude Bragdon

WHENEVER opportunity offers or indulgent editors permit, I am given to saying my say on the subject of ornament, because nothing so reveals our æsthetic poverty as the fact that we have no ornamental mode which we can rightly call our own. So shoot if you must this old gray head, for this is just another wave of the flag nailed from far back on my window-sill.

The need of ornament which should express the psychological mood of this age rather than that of the past, or of an individual, became acute for me in 1911, when I was called upon to design a railway station for my native city of Rochester, N. Y. Though not averse to dipping into the dust-bin of Meyer's "Handbook of Ornament," in this case it seemed imperative that no ornament should be used which antedated steam transportation. There is none. Therefore I was confronted with the necessity of eliminating ornament altogether or of inventing it.

The first seemed too stark an alternative. and the second too difficult for a talent enervated by that order of parasitism practised by me in the past. What I did therefore was to deal with some of the canonical ornamental motifs with a free hand—much as a jazz band-leader might syncopate or otherwise distort the masterpieces of Beethoven and Bach.

This compromise, though moderately successful, was so far from satisfying that I undertook a searching inquiry into the whole subject. One of the things which I discovered was that all good ornament submits itself to a geometrical synopsis; that much of it indeed—like Gothic tracery and Moorish decoration—consists solely of the repetition or the symmetrical assemblage of the most elementary geometrical forms, and that all floral forms have a mathematical substructure: the rock can exist without the lichen, but not the lichen without the rock.

In mathematics, then, I seemed to have found the mother lode of all ornament whatsoever, and it was there that I decided to plant my metaphysical spade. Ours is pre-eminently an age of mathematics; not only has it given us our mastery over nature but it has enabled us to penetrate far beyond the range of the senses. Non-Euclidian geometry is a new portal to the world of the wondrous. Sing, therefore, the mathematical age in terms of its own music, by making mathematics yield the ornamental mode of which we are in search. Such was my conclusion, shared, I found afterwards, by Ruskin, who wrote: "I believe the only manner of rich ornament that is open to us is in geometrical color mosaic, and that much might result from taking up that mode of design."

Easily said; not so easily accomplished. My position was something like that of Watt at the time when he observed that the expansive force of steam was sufficient to blow the cover off a tea-kettle but had not devised a way to make it run an engine. My idea was good, but how could I develop it?

I took as my watchword Keats's dictum: "Beauty is Truth; Truth, Beauty." Philip Henry Wynne had once told me that mathematical truth was absolute within its own limits, I had therefore only to discover some method of translation of the *truth-to-the-mind* into *beauty-to-the-eye*. In time I discovered several, and there are doubtless many others awaiting any one who devotes himself to this quest.

MAGIC LINES IN MAGIC SQUARES

My first experiments were with magic squares, because a magic square constitutes a conspicuous instance of the intrinsic harmony of number—of mathematical truth: A magic square is a numerical acrostic; a progression of numbers (usually arithmetical) arranged in square form in such a manner that those in each band, whether horizontal, vertical, or diagonal, shall always form the same sum.

Now, every magic square contains a magic path, discoverable by tracing the numbers in their original sequence from cell to cell and back to the initial number. This is the magic line. Such an endless line makes, of necessity, a pattern, and these are interesting and sometimes beautiful—the raw material of ornament. At all events in this way the chasm between number and form has been bridged, mathematical truth has been made to reveal itself as beauty. It remained only to intensify this beauty—to

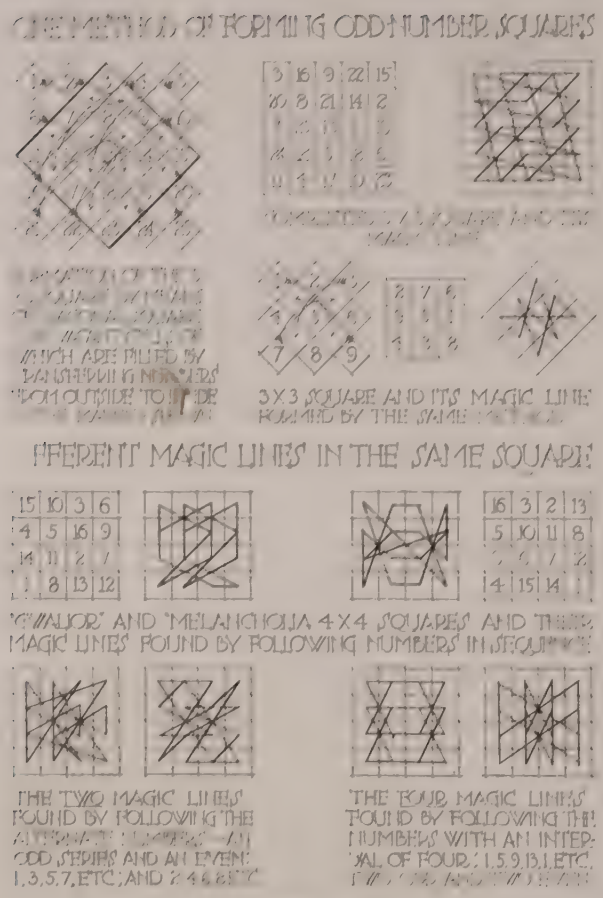


Illustration 1

deal with the magic line in such a way as to subserve æsthetic ends.

I began with the simplest of all magic squares, that of 3 by 3, consisting of the nine digits, three in each row, with a magic sum of fifteen. It is constructed according to the following rule, applicable also to all odd-number squares:

The numbers are first written in their natural order, equally spaced, in lines of equal length, so that the whole forms a square. Parallel diagonal lines are then drawn between these numbers with the effect of forming rectangular cells, every alternate cell being a blank. The empty cells are filled as shown graphically in illustration 1.

By following the numbers in their natural order from cell to cell, using a free-hand curve, a line of intrinsic beauty is developed—the magic line of the 3 by 3 square, as shown in illustration 2. I used this as a Celtic interlace, combined with floral forms, for a series of ceiling ventilators, cast in white plaster, in the Rochester Chamber of Commerce, as shown in illustration 3. I was amused by the comment of an eclectic architect: "I don't remember that design in Meyer's 'Handbook of Ornament.'" He seemed to feel that I had cheated because I had *not* used a crib. In illustration 4 two other decorative uses of this line are shown. In its angular form it yields the border shown in illustration 5.

Another method of formation yields what

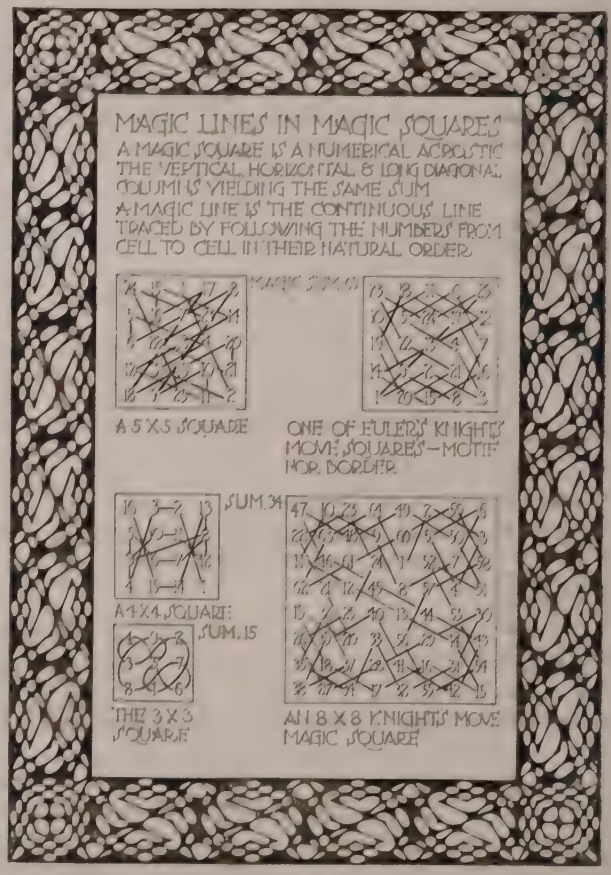


Illustration 2

are known as "knight's move" squares, so called because the magic path follows the move of the knight on a chess board—two squares forward and one to right or left. Two examples of these knight's move squares are shown in illustration 2, one of 5 by 5 the line of which supplied the motif for the enclosing border; and one of 8 by 8, whose line is seen developed into the book-cover design shown in illustration 4. Other knight's move squares account for the elevator door in illustration 6, and the cabinet doors in illustration 7.

But there is another way of using magic lines which gives individual initiative and the æsthetic intuition freer play. This is by repeating and reversing any given line and ar-

ranging them in chess-board fashion, and using the network thus engendered as a warp for the weaving of a great variety of patterns, for it acts both as a guide and a check. In this way the creative faculty is subjected to a control and direction which, because it is mathematical, makes for a beauty which is orderly and necessitous. A textile pattern made according to this method is shown in illustration 4, and I have developed others from this same line, used in this way. With the number of lines at one's disposal the possibilities are infinite.

DESIGN FOR A VENTILATING REGISTER DERIVED FROM THE MAGIC LINE OF THE MAGIC SQUARE OF 3

Illustration 3

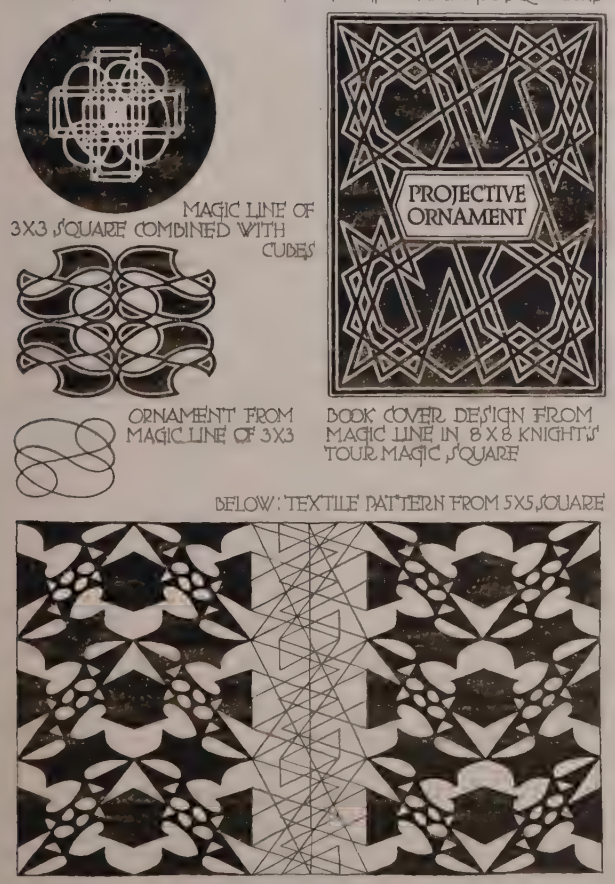


Illustration 4

The number of magic lines at the disposal of the designer is practically limitless. To a mind uninitiated to the wonder-world of mathematics it may seem remarkable that there is even one arrangement of the numbers from 1 to 16 in square form in which the vertical, horizontal, and diagonal columns will yield the same sum, 34, whereas it has been estimated that there are no less than 384 possible arrangements, each yielding, of course, a different magic line. Furthermore, from every one of such squares more than one line can be developed, for in addition to the line which results from following the numbers in their natural sequence—1, 2, 3, etc.—two other magic lines are developed by following the odd numbers and then the even—1, 3, 5, etc., and 2, 4, 6, etc.—and four more lines by using an interval of 4—1, 5, 9, 13; 2, 6, 10, 14, etc. Such lines in the same square being thus reciprocally related, are often more interesting than those of the ordinary sort. Take, for example, the so-called "Melancholia" 4 by 4 square (so called because represented in Dürer's famous etching of that title) represented in illustration 1. Its magic line, developed by following the numbers in sequence, is good enough, but the *two* lines found by following alternate numbers make a better pattern, while the four lines, made by using an interval of 4, yield the best decorative material of all. The same thing holds true with regard to the corresponding lines in the Gwalior square (illustration 1). The leaded-glass design

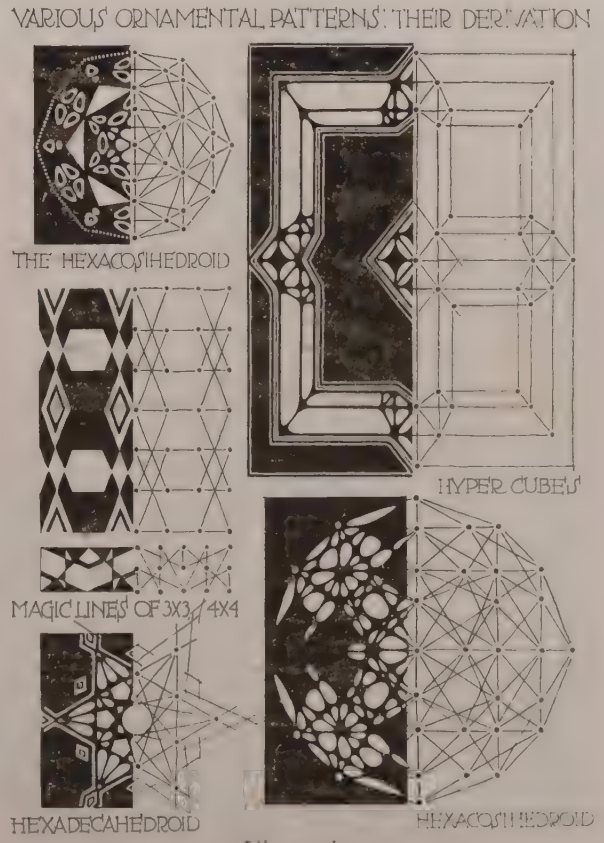
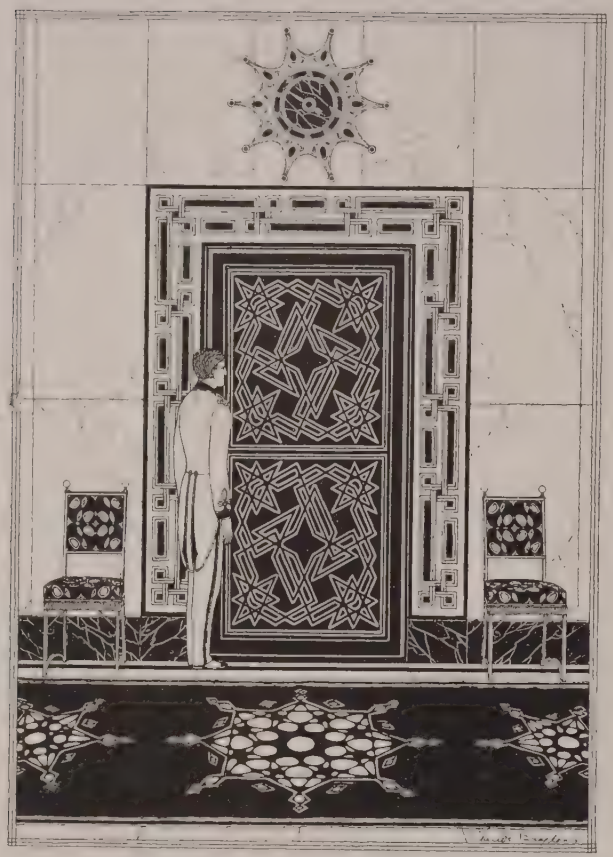
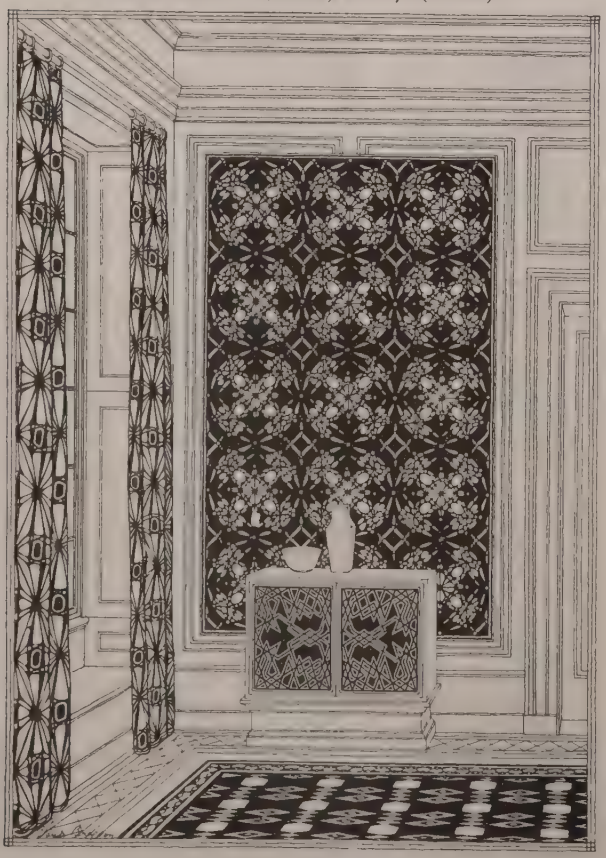


Illustration 5





Illustrations 6 (above) and 7 (below)

in illustration 8 and the rug pattern in illustration 7 are seen to be derived from these two squares.

It is not within the scope of this essay to describe the various methods of magic-square formation; they are easily learned from the available literature on the subject. I might refer the interested reader to W. S. Andrews's "Magic Squares and Cubes." In general, it may be said that magic-square formations are the result of rotations which establish a *polarization*, and they are as different from any fortuitous square arrangement of numbers as a horse-shoe magnet is different from a horse's shoe. This balance or polarity is indicated to the eye by the magic

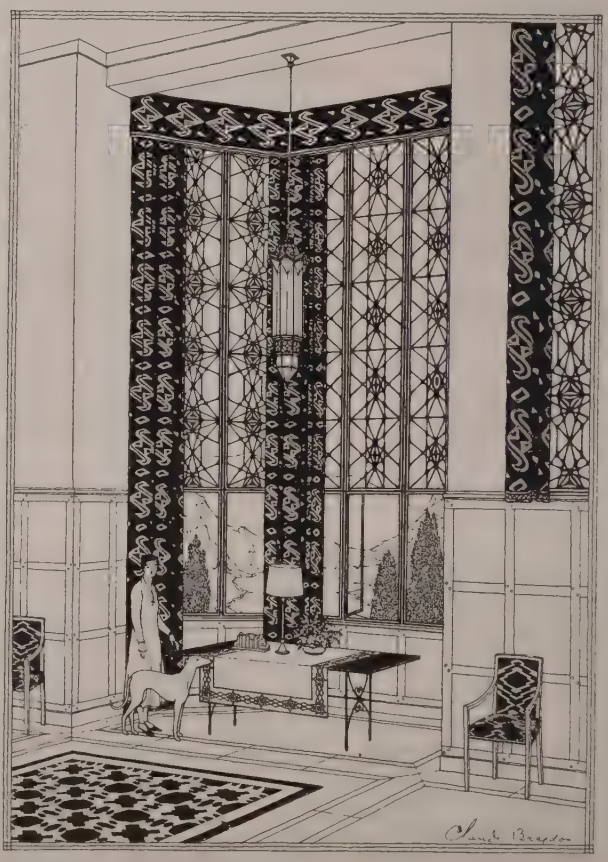


Illustration 8

line in a manner analogous to the way that magnetism in a magnet is revealed by the shapes assumed by iron-filings exposed to its magnetic field.

I believe that magic lines are a legitimate and useful aid to the designer of ornament, if not slavishly used; for the æsthetic faculty, the intuitive perception of beauty and rhythm, and not a mathematical formula, should be the final arbiter.

[PART TWO WILL APPEAR IN THE JUNE ISSUE]

Veterans' Memorial Bridge over the Genesee Gorge, Rochester, N. Y. Gehron & Ross, architects; Frank P. McKibben, engineer. For this bridge and the one at Harrisburg, Pa., Mr. Gehron was awarded The League's Silver Medal in Architecture

The Architectural League Exhibition

AWARDS

Silver Medal in Architecture for works of major importance, to William Gehron, of Gehron & Ross, for the Memorial Bridges at Harrisburg, Pa., and at Rochester, N. Y.

Honorable Mention for works of minor importance, to Philip T. Shutze, of Hentz, Adler & Shutze, for the residence of Mrs. J. J. Goodrum, Atlanta, Ga.; to William L. Bottomley, of Bottomley, Wagner & White, for the residence of Amory S. Carhart, Warrenton, Va.; to Leigh French, Jr., for the residence of Mrs. Evelyn Patterson, Dayton, Ohio.

Gold Medal of Honor in Painting to D. Putnam Brinley for his "County Fair" and other works.

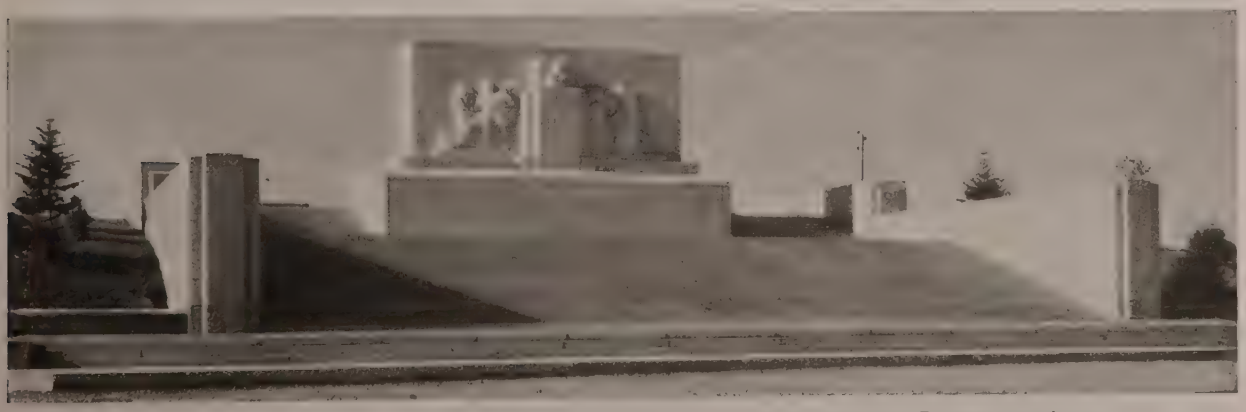
Gold Medal of Honor in Sculpture to A. Stirling Calder for his statue of Leif Ericson.

Gold Medal of Honor in Landscape Architecture to Annette Hoyt Flanders for the French Gardens around the Play House of Mr. and Mrs. Charles E. F. McCann, Oyster Bay, Long Island.

Gold Medal of Honor in Native Industrial Art to Ravenna Mosaics, Inc., for excellence of craftsmanship, particularly in color and materials in the Greek study of Leon V. Solon.

Michael Friedsam Medal to Albert Blum for the printing and dyeing of silk fabrics.

Avery Prize for Small Sculpture to David Rubins for his "Victory."



War Memorial near Bellicourt, France. Paul P. Cret, architect; A. Bottiau, sculptor

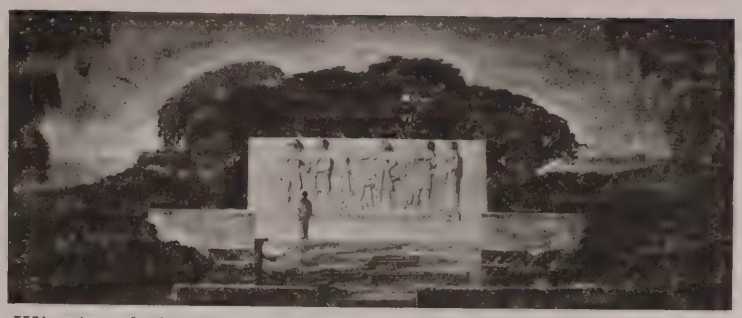
Map of Canada designed by A. Manghanti for City Bank Farmers Trust Building, New York City. Cross & Cross, architects

Study in the Greek (fifth century) manner in silhouette mosaics by Leon V. Solon. Executed by Ravenna Mosaics, Inc., who received the Gold Medal of Honor in Native Industrial Art

Solarium end of natatorium, Sports Building, College of New Rochelle, New Rochelle, N. Y. Office of Henry J. McGill, architects

A Georgian garden near New York. Marian Coffin, landscape architect. The stone dogs, by Wheeler Williams, sculptor

"The Merchant of Venice," a panel on the exterior of the Folger Shakespeare Library, Washington, D. C. John Gregory, sculptor; Paul P. Cret, architect; Alexander B. Trowbridge, consulting architect



Winning design for Monument to the Memory of the First Permanent Settlers of the West at Harrodsburg, Ky. Francis Keally, architect; Ulric Ellerhusen, sculptor; Armistead Fitzhugh, landscape architect

Interior of chapel, Hotchkiss School, Lakeville, Conn. Delano & Aldrich, architects

House of Amory S. Carhart, Warrenton, Va. Bottomley, Wagner & White, architects; Charles F. Gillette, landscape architect. For this work William Lawrence Bottomley received Honorable Mention for works of minor importance

Looking into courtyard, house of Schofield Andrews, Chestnut Hill, Philadelphia. Tilden, Register & Pepper, architects

Aluminum grille for house of Frederic W. Allen, Manhasset, Long Island. Austin Purves, Jr., designer; Cross & Cross, architects

Spiral stair of red oak, steps mortised and tenoned in three-sided spiral carved post. Designed and executed by Wharton Esherick

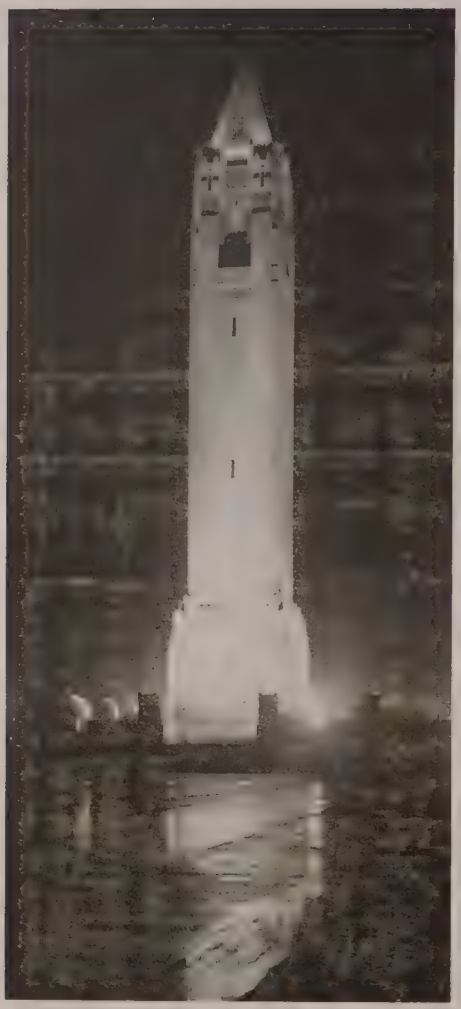
House of Detention for Women, New York City. Sloan & Robertson, architects

House of Mr. and Mrs. Randolph P. Compton, Scarsdale, N. Y. Electus D. Litchfield, architect; Ruth Dean, landscape architect

Aluminum grille for house of Frederic W. Allen, Manhasset, Long Island. Austin Purves, Jr., designer; Cross & Cross, architects

Women's City Club, St. Paul, Minn. Magnus Jemme, architect

Plaster model of statue to Leif Ericson for which and "for the originality of conception of his many high achievements" A. Stirling Calder received the Gold Medal of Honor in Sculpture



Water tower at Jones Beach, Long Island. Herbert A. Magoon, architect; Harvey Wiley Corbett, consultant

Master's bedroom in the residence of Alfred Mausolff, architect, New Canaan, Conn. The built-in bed has a casement window of its own with heavy curtains to keep the bedroom warm at night

Plaster model of bronze doors for the main entrance of Ohio State Office Building, Columbus Ohio. Alvin Meyer, sculptor; Harry Hake, architect

"Science," a panel for the entrance lobby of the New York Museum of Science and Industry, New York City. Paul Fjelde, sculptor

Napoleon China Room, apartment of Archibald M. Brown, River House, New York City. Peabody, Wilson & Brown, architects

Main entrance, Sports Building, College of New Rochelle, New Rochelle, N. Y. Office of Henry J. McGill, architects

Headquarters of the New York Chapter, American Red Cross, New York City. Delano & Aldrich, architects

Plaster model of Mori Memorial, Woodlawn Cemetery, New York City. Charles Keck, sculptor; Raymond Hood, architect

"County Fair," painted by D. Putnam Brinley. For this, "together with other works, notably the decoration for the Brooklyn Savings Bank and for the essential decorative quality of his work through many years," Mr. Brinley received the Gold Medal of Honor in Painting

Reception room, Irving Trust Company Building, 1 Wall Street, New York City. Hildreth Meière, designer of the glass mosaic; Ravenna Mosaics, Inc., craftsmen. Voorhees, Gmelin & Walker, architects

Reception Room, Elks National Memorial, Chicago. Egerton Swartwout, architect; murals by Eugene Savage

Even in these days, when our understanding and appreciation of collaboration have shown marked increase, architecture frequently is designed by itself and for itself, with the allied arts following along as afterthoughts. Not so in the case of the Elks National Memorial. Egerton Swartwout designed it as a monument which should be a complete creation only when painter and sculptor had finished their work. The following photographs illustrate this fact with unusual emphasis

Architecture, Sculpture and Painting

The main entrance, before and after the sculptured band had been carved above the rusticated base
Egerton Swartwout, architect; A. A. Weinman, sculptor

Memorial Hall, before and after the murals were put in place. The whole scheme of the interior, even to the selection of the marbles, was designed for the effect which has only now been achieved

Egerton Swartwout, architect; Memorial Hall murals by Eugene Savage; mural in the distant lobby by Edwin H. Blashfield

Another view of Memorial Hall, showing, in this and the photograph opposite, the extent to which the scheme as a whole is dependent upon the closely welded work of architect, sculptor, and painter

Egerton Swartwout, architect; murals by Eugene Savage; sculpture in the niches (Charity, Justice, Brotherly Love, and Fidelity) by James E. Fraser

Detail of the wall painting, "Paths of Peace," shown in the Reception Room on page 217. The small sculpture seen in silhouette on the table is by Laura Gardin Fraser

Egerton Swartwout, architect; Eugene Savage, painter

Some Pitfalls in Supervision

By W. F. Bartels

XIX. PAINTING

PAINTING is at once an art, a racket, and (to the superintendent) a "headache." To the designer and owner it is one of the last steps in their efforts to achieve beauty. To the painter—too often—it means fooling every one he can. But to the superintendent it means a final nightmare. The painter's bagful of tricks is full and varied. Many of these are common. But, since many a painter seems to have little private ones up his sleeve in constant readiness for special use on particular people, the superintendent's sleuthing is not the simplest. He must be ever on the alert and half the time refuse to believe even what he sees.

The first story the painter tells is this: He has been in business for over thirty years, and uses nothing but pure white lead and pure linseed oil in mixing his paints. Just what these statements mean no one knows, but nine out of ten painters carry them as a part of their permanent equipment.

When red lead and linseed oil is specified for iron, it is seldom used. Venetian red too nearly approximates the color of red lead to be readily detected, and, when mixed with the proper pigment and oil, a man can apply it twice as fast as red lead and oil. The latter combination is more expensive in materials, but an even greater margin exists in the labor required. A painter I once caught using a substitute stoutly denied it to be anything but red lead. I told him it was not gritty enough to be red lead. On the next inspection the same paint was still being used. On being reprimanded the painter argued that it was new paint, and said: "Just feel how gritty it is." He was right. It was as gritty as sand paper. But I reminded him that his shanty, which was open, contained a bag of fine marble dust—but no trace of red lead.

When it is desirable to thin paint, turpentine is generally avoided and benzine or kerosene substituted, because brushes slide more easily with them. The use of either should be strictly forbidden.

On one job a painter was employing a thinner in a prepared paint, contrary to the directions for using the latter, and forbidden by the specification. Several barrels of thinner were finally found, whereupon the painter promised not to use it again. A chance conversation with the driver of the truck delivering the paint barrels revealed that instead of their coming directly from the freight station as previously, they were now being brought from the painter's shop. The supposedly new barrels were carefully examined and appeared to have been tampered with. The paint was analyzed and found to have been thinned. Confronted with this, the painter admitted thinning the paint at his shop. And, needless to say, the job was thinned of one dishonest contractor. Then followed the kind of anti-climax which gives superintendents gray hairs or hydrophobia. After a large painting firm had been given this same job, they maintained that thinners would have to be used. They summoned a representative of the paint makers to bear out their contention. (Naturally a concern which was a good customer must not be offended!) So the irony of the story is that the representative of the paint makers gave his unqualified approval to use almost as much thinners as did the contractor who had been put off the job. And the architect was overridden by an appeal direct to the owner.

Another owner, desiring to get a high quality paint job, gave orders that none but Blank Brand paint should be used. The painter acquiesced, and Blank Brand paint was delivered, although in such a small quantity that it would obviously do only part of the job. The barrels were stored in the painter's room. Some days later enough paint for the entire job was seen in the painter's room. A careful check was made. Blank Brand labels had been taken off the original containers and put on the substitute barrels of paint. A telephone call to Blank Brand's agent revealed that no such quantity had been purchased, whereupon the painter was faced with the problem of removing it all from the job at once or facing more serious charges.

Trickery extends even to the sizing of ceilings to be calcimined. A painter caught calcimining without sizing agreed to do it properly and made a big show of preparing the size. When the superintendent, not entirely satisfied with the looks of the size, tested it he found it to be only dirty water.

It is evident from these stories, for which the writer can vouch, that no precautions should be overlooked in an effort to check all materials

which are used. The architect's reputation is at stake in this trade as well as in the others. But the superintendent's ingenuity as a Sherlock Holmes will be taxed to the limit in jealously protecting both his employer's name and the owner's investment.

Where one or two ground coats are applied, followed by an enamel or similar finish, it is fairly easy to keep a check on the work done. It is on outside work, such as for windows, that the number of coats becomes difficult to check. If it is possible without having a deleterious effect on the final color schemes, a different shade or color should be used for each successive coat, enabling the number of coats to be readily determined. On built-up work of the same color, a mark must be depended upon. It is advisable to put this on the identical spot each time, and either so small as not to be seen or made to resemble a small accidental smudge. If the coats on the exterior windows are to be all the same color, a small number on the muntin or other inconspicuous place enables the superintendent to keep tab on the number of coats. A painter boss may intend giving the proper number of coats but his workman, when left by himself on a floor, may feel that a rest will do him more good than paint will do the window sash.

It should be kept in mind that the finishes applied are expected to last a long time, hence any effort to employ shortcuts or hurried applications will only be lamented in the years to come. A case might be cited where a standard brand of paint was used on the entire exterior of a house. It was a good paint, but, to avoid the hard labor necessary to apply it, the painter thinned it considerably with turpentine. The paint as prepared by the manufacturer was sufficiently good to last in this section for four or five years. Instead, at the end of the second year it was chalky and showed obvious loss of its binder (linseed oil), which had been so cut by the thinner as to lose its ability to withstand the weather.

When the exterior is ready for paint the superintendent will of course see that in the case of iron work the surface is free from rust and scale. Any scale that can be seen, and some that cannot, will often hold enough moisture to cause more scale and rust to form, and, if painted over, will sooner or later cause the paint to peel or blister. The surface of woodwork must also be clean. The wood should be free from moisture. In the case of knots or sappy-looking spots, a coat of shellac should be put over such places before the paint is applied; otherwise they will show through later. Putty that is used in nail holes and other spots should be of good quality and have some of the paint mixed with it. Bare spots must be primed before puttying. Failure to do this will allow the wood to absorb all the oil from the putty with resulting spots later on. The superintendent should not allow paint to be applied in any but dry and above-freezing weather. Paint should not be applied in torrid sunshine or in excessive heat. The paint should be well brushed in and given plenty of time to dry before a second coat is added.

On interior work all surfaces should of course be clean. On new work this is assumed, but on old work if a satisfactory job is desired the surfaces should be cleaned with either soap and water or a cleaning solution.

Painting on plaster before it is thoroughly dry will result in peeling. In fact, the plaster should be allowed to set as long as possible before it is painted. Alkalies in the plaster will result in spots and peeling of the paint. If it is desired to make sure no alkali spots are present, a small amount of phenol-thalein, brushed on with a small clean brush, will show a pink or red color. Washing the plaster with a solution of zinc sulphate will go far toward reducing the effective alkali on the plaster surface. If the spots appear on plaster already painted, a paint with aluminum as a pigment is very efficient in stopping "burning spots."

Finally, it might be said that paint should wear off—but should not peel, crack, or flake off. Provided a good paint is used, most defects are due to improper application or application at the wrong time. Blistering and peeling are directly traceable to painting over moisture.

Cracking of paint is generally due to drying or contraction of the wood, and of course cannot be justly held against the paint itself.

Spotting is caused by the surface materials absorbing the oil in the paint; it is prevented by shellacking all soft spots before painting.

Checking is due to a contraction of the paint itself, and is most frequent where the tension of the several coats differs.

The Architectural Observer

IN this architectural day when we try hard to find new "forms" and congratulate ourselves when we do, it is ironically amusing to find tucked away in some little hamlet occasionally a brand-new form which we were the first to discover—or so we thought. If you take the main road leading southward out of Auxerre in the province of Yonne, not many kilos pass before you arrive in Vincelottes. The main show is secluded across the river, which is lucky for it, considering the number of tearing tourists which stir up dust on the main highway. But on the far

or east side of the Yonne River you can find this novel arch *parti*. The stone is varied in color—buff somewhat, gray too, and running toward dark tones in places. There is no date on the building. But from all appearances the modern movement could have been born within its walls.

THE cottages and barns surrounding the Hall at Chipping Warden (about six miles northeast from Banbury) form one of the most idyllic groups in the Cotswold country. On every hand there is some unusual solution, such as this combination of pedestrian and carriage gates. The outstanding feature about these gates is the excellent brand of home-made engineering: the top horizontal members are the heaviest, as they should be, and the diagonal braces have vertical supports. The vertical which carries the hinges is far heavier than the other one, which has only the latch—also as it should be. Yet most of our gates in this country are invariably of a uniformly thick frame, which not only adds dead weight at the very point it should be lightest, but appears less beautiful

than this example. Viewed from a purely esthetic angle, the pattern is not so different from the type of geometry subscribed to by the moderns in terms of extravagant praise. Yet no one at Chipping Warden thinks it anything but a good old-fashioned gate.

BRICK work is being strained to unusual limits these days, but this example in Fritz Höger's Municipal Building in Rüstringer seems to be about as far as one could go in this direction.

The Editor's Diary

Monday, February 1.—Attended a dinner arranged by Aymar Embury in honor of Diego and Mrs. Rivera, at which I was hoping to have a chance to hear something of his philosophy of life and painting. Unfortunately, he speaks no English. Ted Embury's caricatures of Rivera's work, numbered, hung, and catalogued in true exhibition fashion, formed one of the most enjoyable features of the affair.

Tuesday, February 2.—Mischa Elman played for us after lunch, and I was impressed as never before with the tremendous expenditure of self inherent in the true master's efforts in self-expression. Playing with his eyes almost closed, and with an almost visible flow of emotional energy from his body, he seemed limp at the end of the three numbers. Even when one has mastered his technique, there seems to be no possibility of self-expression in any form without tremendous concentrated effort. I was interested in the care bestowed by Elman upon his violin, which he returned with many wrappings of silk, linen, and wool to its bulky case, looking for all the world like a built-in Russian bed.

Wednesday, February 3.—Edwin H. Hewitt of Minneapolis dropped in on his way to Washington, and joined the architectural editors at their monthly luncheon at The Architectural League, bringing us none too cheerful news of architectural progress in Minnesota.

Thursday, February 4.—Robert Edmund Jones, just back from Hollywood, gave us some of his impressions at The League to-night. Jones finds something fascinating in the place, and also something sinister. Its fascination lies partly in the fact that here is a community of people in which the attainment and preservation of physical perfection is the first law. It is also a land of miracles. To one who is accustomed to the limitations of the stage—the things that the carpenter, the electrician, the painter cannot do, Hollywood outdoes Aladdin and his lamp. One has only to ask for something—anything—and it is produced. While Jones was there some one took it into his head that he wanted four hundred Pygmies. He got them. But the less inviting side of the picture lies in the fact that possibly the screen as it now exists is dulling our imagination. The days of illusions are gone. What we want is the actuality, or at least a close-up photograph of it. Is it possible that in satisfying our appetite for photographic realism, we are atrophying our power to think and to imagine?

Friday, February 5.—Last spring, on the way back from Paris, William Van Alen tucked a luncheon menu for Wednesday, June 17, into a beer bottle, having noted on the card the fact that he would pay five dollars for its return. The other day a letter appeared claiming the five dollars, signed by Colin Campbell, Argyllshire, Scotland, where the bottle was discovered on January 10. The bottle had made a journey of no less than two thousand miles.

Saturday, February 6.—Almost over night the gravity system of hot air heating has become metamorphosed into a new thing—warm air heating under pressure. Warm air heating, after having been knocked about the ring a bit by hot water and vacuum vapor systems, has suddenly come back with a new strength. Warm air heating in its present reincarnation, which provides filtered and humidified air under pressure, will bear watching. It is a question of a very short time before we shall have, even for residential work, complete air conditioning. At the moment all that the new warm air systems lack is cooling for hot weather. At present it can be done, but at too great cost. That hurdle will soon be leaped.

On the other hand, the hot water, steam, and vapor systems are by no means inactive. Already there is at least one self-contained unit which will supply humidified warm air in the winter and dehydrated cool air in summer—an attachment to a steam or vapor system.

Monday, February 8.—Attended a dinner meeting of the Snag Club to hear David Coyle discuss with this representative group of men interested in civic betterment, the question, "Can We Tax Ourselves Into Permanent Prosperity?" Sat next to Henry Pratt Fairchild whose article, "The Fallacy of Profits" in the February *Harper's* makes very clear the fact that in this period of plenty-economy we have got to revise our habits of mind formed by the age-long period of deficit-economy. The things that were proper for us to do in a time when we were unable to produce enough for our needs are the things that are quite wrong for us to do now.

Tuesday, February 9.—Dropped in at The Public Library this evening to see the opening of the annual exhibition of Fifty Best Books of the Year. Edward F. Stevens, chairman of the committee responsible for assembling the exhibition, presented Frederick G. Melcher and Lester Douglas who reviewed the year's work. It was interesting to see in the slides that were shown, and in the books themselves shown in another wing of the library, a tendency paralleling that in architecture, of using traditional forms as a point of departure rather than in imitation. As compared with architecture there seems to be decidedly less of a break with tradition; rather, an evolutionary development from the traditional forms with a freshness and inclination toward greater sprightliness instead of pure dignity.

Wednesday, February 10.—Forty of his brothers in the arts gave a dinner to-night to Joseph Urban upon the occasion of opening his one-man show in The League galleries. Julian Levi presided, and called upon Grover Whalen, Deems Taylor, Alvin Johnson, Raymond Hood, Harvey Corbett, John Holabird and Ely Kahn. Like the dinner to James Monroe Hewlett, it was largely a demonstration of affection on the part of every one present for an artist who has pointed the way to a clean, fresh, open-air kind of architectural expression. As Harvey Corbett put it, one cannot enter into this exhibition without having the feeling of just having had a cold, refreshing shower. Artur Bodanzky joined us after conducting Donna Juanita at the Metropolitan, and found the party going strong.

Friday, February 12.—Ely Kahn is busy these days with a most engrossing job—that of chief of the industrial arts section of the World's Fair. He conceived the idea of showing, in a circular or polygonal building, various developments of our industrial arts, somewhat as was done at the Metropolitan Museum two years ago. The group would show possibly a living-room, library, kitchen, business office, a sales office—all of which would be furnished and equipped with the products of our industrial arts system. The public, having examined the complete product in place, might conceivably want to know how these things were made. Extending radially from the building behind each of the completed works would be exhibits showing the processes that contributed to the finished result—new textiles in the making, the fabrication of metals, wood veneers, wall materials, carpets, furniture. Such a feature would certainly be worth going a long way to see, even if there were nothing else in the Fair.

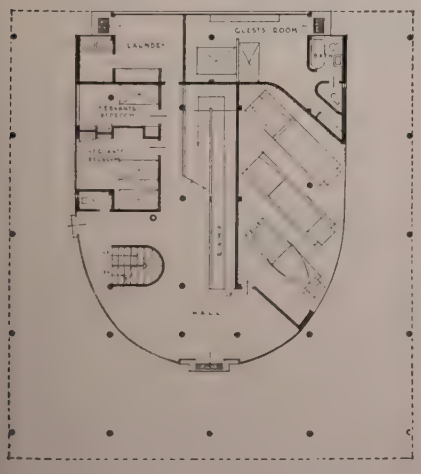
Monday, February 15.—The building industry being apparently at its nadir, it seems an ideal opportunity to build

oneself a house. The excavation having been made in a day and a half with the aid of a steam-shovel and without encountering any frost in the ground, I went to Huntington to see the footings properly laid. The cost of residential construction on Long Island at the moment seems to be little more than one half of what it was three years ago.

Tuesday, February 16.—Thomas S. Holden, in a paper delivered before the American Statistical Association, brings to light a new factor to be reckoned with in estimating our national construction in the future. We have always figured upon a constantly growing population, which increase naturally requires housing, stores, churches, etc. It now appears that our population growth is slowing down, and may soon become stationary. This would mean that in our building for the future we must lay more stress upon rebuilding outworn structures and building them better, rather than merely adding to our volume.

Thursday, February 18.—The Architects' Emergency Committee put on display to-day the drawings received as a result of a competition for a factory-built small house. The details as to the awards will be found in the Bulletin Board pages. Talked with S. Clements Horsley, whose design won the first prize. His scheme called for a light steel frame on which were hung wall slabs consisting of two finished faces with an air space between, this air space to be varied in width to meet requirements of space for piping. Vertical and horizontal joints in these slabs were to be filled with mastic. Mr. Horsley seemed to be laboring under the delusion that his house could be erected in ten days at a cost of three thousand dollars. Many of the designs showed an intelligent grasp of prefabrication requirements, but very few of them a correspondingly able grasp of æsthetic requirements.

Friday, February 19.—Lunching with Julius Gregory to-day, we fell to discussing the enormous amount of stress that this generation lays upon gadgets in building. Most of them are rather widely known through the efforts of the advertising fraternity, but one that was new to me is radio control of garage doors. An "aerial" is sunk in the driveway, and a generating mechanism included in the car. As the car approaches, the underground antenna picks up the impulse, trips the switch of an electric motor, and the garage door is opened. As the car passes in, the lights of the garage are lighted, and the door closed. Incidentally, Gregory was telling me that in a recent installation he utilized the same principle for lighting the lights along the driveway as one approached in a car. Of course, there are other ways of accomplishing the same thing, such as with the use of a photo-electric cell, or even a switch in the driveway, operated when the wheels pass over it, but either of these devices may respond to the wrong car.



"International Style" was the label applied to-night at the Museum of Modern Art to the form of expression that has become so familiar to us in the work of Le Corbusier in France, Dudok and Oud of Holland, Gropius and Miës van der Rohe of Germany, Asplund of Sweden, Howe & Lescaze and Neutra of the United States. The occasion was a meeting for discussion called by Alfred H. Barr, Jr., the director of the Museum, who presented Lewis Mumford, Henry Wright, George Howe, Henry-Russell Hitchcock, John Wheelwright of Boston, Harold Sterner, and Harvey Corbett. Pope Barney of Philadelphia and Raymond Hood also joined in the discussion which, for the most part, was a pæan of praise for functionalism and all its works. It seems a pity that there is apparently a well-organized movement to label and codify contemporary architecture. As Raymond Hood suggested, the moment we try to make rules about color and ornament, materials, shapes, etc., we are confining what might be art in a straitjacket. The work in this so-called "international style" has about it something that is fresh and clean, something that is straightforward and logical, but it also has about it some of the greatest absurdities into which architecture has ever fallen. For example, here is a plan featured in the Exhibition, showing the Savoye house, Poissy-sur-Seine, by Le Corbusier and Pierre Jeanneret. One of the tenets of this new cult is that its work shall be free from traditional restrictions of material or of method. Yet here is a plan which binds itself absurdly into a system of supports. The architects have apparently said to themselves, "Let us design a house in cantilever construction." They have made what is apparently an arbitrary spacing of supports and built upon these. Of what advantage was it to set back the row of columns across the front? The continuous line of windows does not justify it, for the curtains obviously take more space where gathered together than the slim column would have required in the front wall. It would be a strange client who would knowingly take these columns out of the wall and stick them out in the living-room.

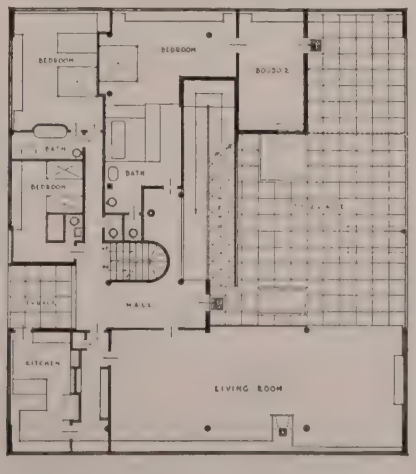
The garage plan seems to indicate that the central car may be driven in without hitting a post, but neither of the other two could make it.

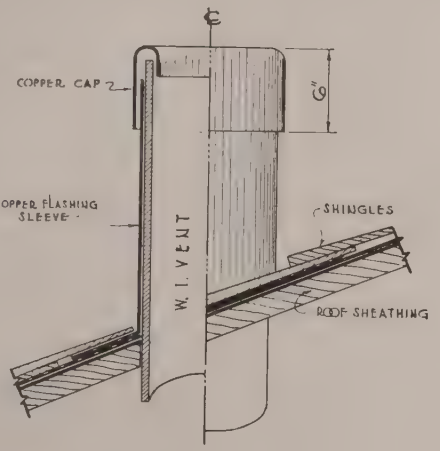
Is there any advantage in appearance or convenience in the form of the guest-room closet? Is there any possibility of using the guest bath in comfort? Is there any advantage in having the occupants of the guest-room double bed dodge a column in getting in or out?

On the upper or main floor, is there a conceivable gain in dragging the fireplace and its chimney out from the wall into the floor space in order to preserve the unbroken band of front windows in the living-room?

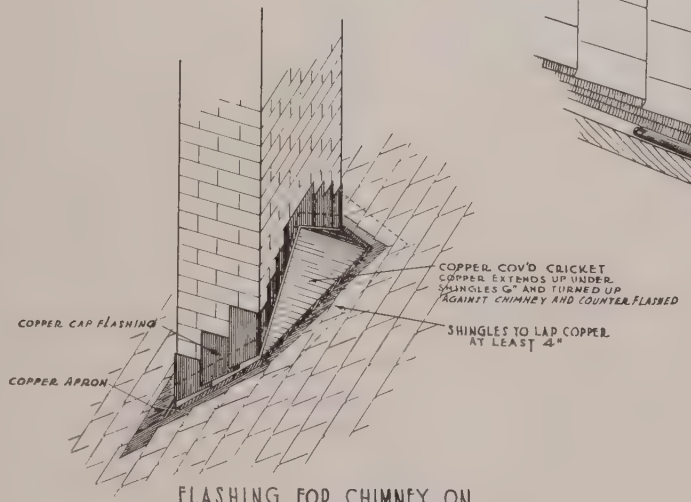
Just why the striving for *la vie intime* in providing no partition between the bathroom and the main bedroom? Possibly there may be some good reason for building a ramp from the ground floor to the main floor, in addition to a stairway, but the need is not obvious.

In other words, have the architects tried to design a livable house, or have they been occupied in solving some abstract problem of cantilever construction?

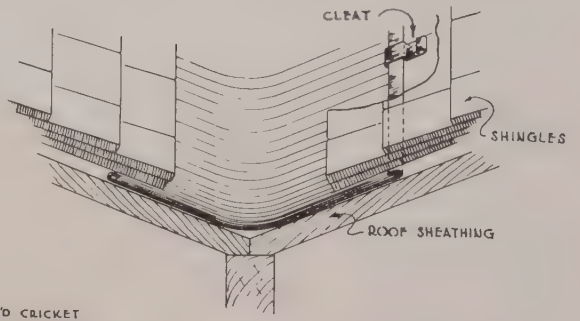




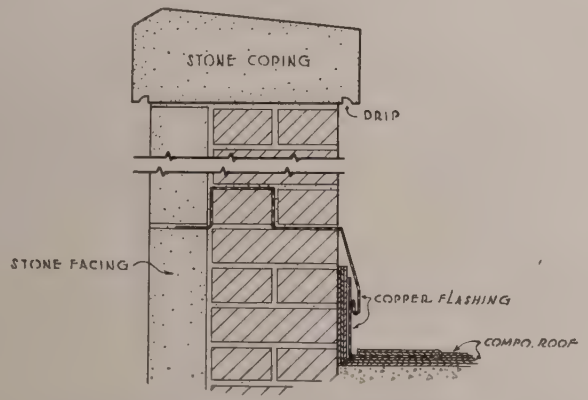
FLASHING FOR IRON VENT



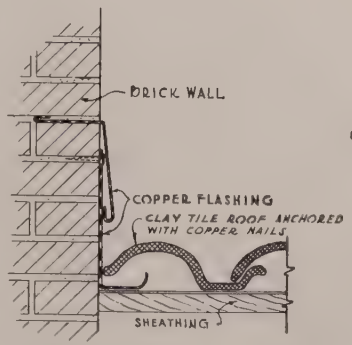
FLASHING FOR CHIMNEY ON SLOPE OF SHINGLE ROOF



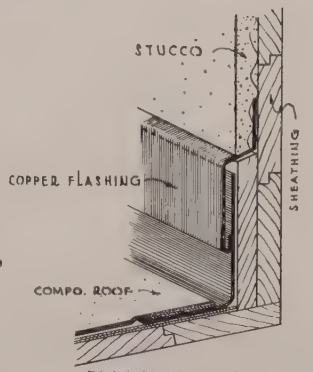
OPEN VALLEY FLASHING FOR SHINGLE ROOF



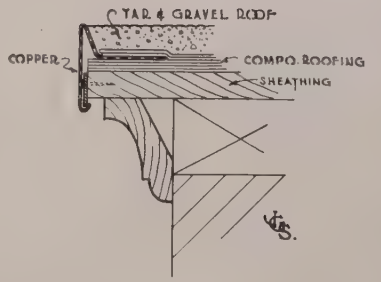
FLASHING FOR STONE FACED PARAPET



FLASHING FOR TILE ROOF AGAINST A BRICK WALL



FLASHING FOR STUCCO WALL ON WOOD CONSTRUCTION ABOVE COMPO. ROOF



GRAVEL STOP & DRIP FOR FLAT ROOF

· DETAIL · OF · ROOF · FLASHING ·

A SERIES OF WORKING DRAWINGS BY JACK G. STEWART

· NO · SCALE ·

· PLATE · Nº 23 ·

Le Puy

THREE SKETCHES IN PENCIL BY GORDON H. KUNZ

The drawing above is reproduced at the same size as the original

At left, the reproduction is from an original measuring 7⅞ inches high. Below, the reproduction is from a sketch measuring 5⅛ inches high.

CONTACTS

DEVOTED TO A BETTER UNDERSTANDING OF THE BUSINESS SIDE OF ARCHITECTURE AND ITS RELATION TO THE INDUSTRIES

A Score Card for a House

THE elements on which one must base an opinion of the quality of a house, as a place in which to develop a home, are many and diverse. The lack of any standard measuring rod by which to appraise their relative values makes difficult the establishment of any agreed rating for individual houses.

The Committee on Design decided that it would be helpful if an acceptable standard Score Card could be devised that would indicate the various basic elements involved and establish approximately accurate relative values for these elements, so that a final composite rating could be calculated that would indicate the quality of the house as a whole.

Tentative drafts were considered by the committee, and the difficulties involved in the design and practical use of a Score Card were made clear, but its value was equally clearly indicated. It was therefore decided to include in an addendum to the committee's report a tentative draft of a Score Card with a brief explanation of its construction and use, in the hope that it might later be perfected into a form generally acceptable and capable of helpful use.

The committee desires to emphasize the fairly obvious fact that impartial appraisers are essential if the use of a Score Card is to develop a dependable rating. The judgment of the owner of the house would generally be prejudiced on certain points and inexpert on others. The judgment of a real-estate operator about a house he was trying to sell, or of an architect about a house he had designed and supervised, would be equally and inevitably prejudiced.

Both architectural and real-estate values are involved as well as financial judgment. It is suggested that an appraisal should therefore be based upon the united judgment of an architect and a realtor, and that possibly to those should be added a banking agency official.

In one community it is already proposed to create within the local Building Congress an appraisal committee to appoint appraisers and to review appraisals, thus creating official standards for the community which would tend automatically to eliminate the sub-standard product.

The President's Conference on Home Building and Home Ownership brought out an overwhelming mass of findings as a result of the committees' preliminary study. Not the least valuable is the following, which constituted Addendum 5 to the report of the Committee on Design, of which William Stanley Parker, of Boston, was chairman, and Henry Wright, of New York, was research secretary.—EDITOR.

The following tentative draft of a Score Card is presented as a first step, and in no sense as a final conclusion. Comments are requested, and it is hoped that serious study of it will be given by architects, realtors and bankers in many different communities with a view to perfecting it into a practicable instrument that will be helpful by creating that standard measuring-rod which to-day is clearly lacking.

Attention is called particularly to the footnote to the Score Card which states that to be entitled to a final composite rating a house must have a rating of at least 60 per cent on each of the six main items. This seems a desirable rule to apply in some way. A person contemplating building or buying a house is solely interested in the result as a whole. He desires assurance that the design and the construction of his house are adequate, but these will be of small consolation to him if he finds he has built his house in a depreciating or unprotected district that makes his house valueless as a home in a few years.

Serious deficiency in any one of these six underlying factors may outweigh a perfect score on all the other items. We have suggested 60 per cent as the low limit of safety. This is a pure assumption and we are not prepared to say that 75 per cent or even 80 per cent is not a better percentage to adopt for this purpose. Perhaps only practical experience in the use of such a Score Card can determine this question, which is one of many questions concerning the Score Card on which comments are desired.

SCORE CARD

A. Surrounding Community Conditions	1000
(1) General character of occupancy	
(2) Trend of character of occupancy	
(3) Service by public utilities	
(4) Transportation facilities	
(5) Recreational facilities	
(6) Health conditions	
B. Obsolescence	1000
(1) Character of property in relation to current type of construction	
(2) Character of property in relation to current types of equipment	
(3) Character of property in relation to modern living habits and economies.	
C. Physical Depreciation	1000
(1) General structure	
(2) Exterior finish	
(3) Interior finish	
(4) Heating plant	
(5) Plumbing	
(6) Wiring	
(7) Equipment	
(8) Appurtenances	
(9) Planting	
D. Relation of House to Surroundings	1000
(1) Outlook and orientation	240
(2) Relation to adjacent property uses	240
(3) Adequacy of lot	200
(4) Location on the lot—privacy	160
(5) Garage and services	80
(6) Planting	80
E. Design	600
(1) Plan	
(*a*) Adequacy and proportions of room sizes	120
(*b*) Inter-relationship of rooms	120
(*c*) Economy of space (halls *vs.* rooms)	120
(*d*) Work spaces and equipment (heat and plant), adequacy, arrangement	80

(e) Light and ventilation..... 80
(f) Closets—size and equipment.. 40
(g) Usable wall spaces..... 40

(2) Appearance..... 400
(a) Exterior Total 240
(1) Use of materials..... 40
Simplicity
Good combination of materials
Logical use of materials
Texture
Character of details
(2) Character of decorative motives..... 40
(3) Relation to adjacent designs.. 40
(4) General mass..... 40
(5) Proportions of openings..... 30
(6) Relation of openings to wall surfaces..... 30
(7) Color..... 20

(b) Interior Total 160
(1) Treatment of stairs..... 40
(2) Relation of openings to wall surfaces..... 20
(3) Treatment of fireplace..... 20
(4) Standing finish..... 20
(5) Treatment of wall surfaces.... 20
(6) Electric fixtures and hardware.. 20
(7) Color..... 20

F. Construction.....1000
(1) Quality of materials....500
(a) Foundations
(b) Walls, floors and partitions
(c) Roofing
(d) Exterior finish
(e) Interior finish
(f) Flooring
(g) Heating plant
(h) Plumbing
(i) Wiring

(2) Quality of workmanship 500
(a) Foundations
(b) Walls, floors and partitions
(c) Roofing
(d) Exterior finish
(e) Interior finish
(f) Flooring
(g) Heating plant
(h) Plumbing
(i) Wiring

Note: If the rating of any one of the six main factors is less than 60 per cent, serious question would be raised as to the value of the property and no final percentage rating should be allowed.

A New Type of Concrete Construction

By
Norman V. Davidson

AFTER seven years of experimentation, a new type of hollow concrete construction has been developed for houses or other small buildings, and is now being used in San Diego, Calif. The system employs what might be termed a wall unit principle and, through its simplicity, surmounts a number of difficulties that have been stumbling-blocks in hollow concrete construction. The general advantages of the system are those claimed for hollow concrete, or reinforced concrete and hollow tile, while the additional claim is made that it allows greater flexibility of design while holding the cost down to a figure comparable with that of common frame structures.

The new system employs a standardized tile unit of channel shape measuring 4 in. by 12 in. by 7 ft. Tiles are placed on end, two at a time, with their tongues fitting into a groove cast in the foundation, and with their hollow sides facing each other. Thus two tiles make a complete wall unit 8 in. thick, 12 in. long, and 7 ft. in height. The tiles are locked to the foundation by a small quantity of cement poured in the base between tongues. At the top, simple metal fittings and a rim of reinforced concrete hold the tiles.

This concrete rim may hold either a ceiling of tile units in conjunction with reinforced concrete joists, and at the same time be the foundation for a second-story wall of tiles, or it may accommodate a roof of either tile or wood.

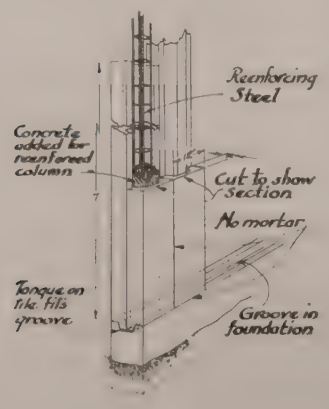
Unlike hollow tile and reinforced concrete construction, the new tile is used as a part of the reinforcing column, which accounts in part for the cost saving claimed. The reinforcing members are inserted in the space between the two tiles and the concrete poured in about them.

Since the new tiles run from the floor to the ceiling, it is unnecessary to plumb each tile separately. The entire wall is plumbed just prior to the pouring of the rim, a step that resembles closely the similar operation in wood frame construction, and it is said to be another feature that keeps the cost down.

The hollow space between the tiles is ample for all plumbing and electrical conduits and the surfaces are sufficiently rough to allow a good bond for application of the stucco directly on the outside or plaster on the inside, without lath or other material for binding. In this climate the need for furring is not pressing.

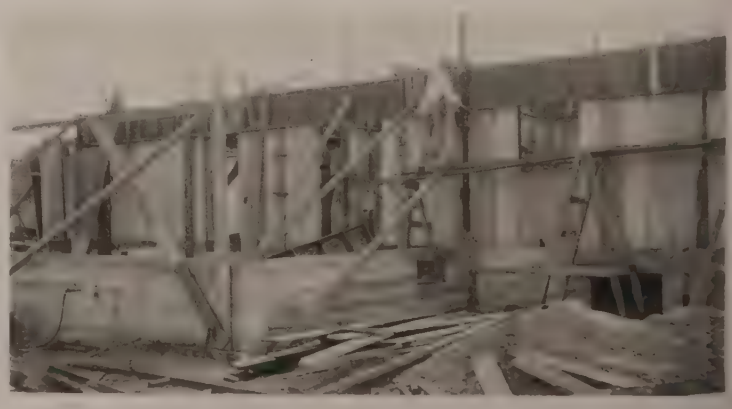
Since the structural system calls for nearly 100 per cent concrete, the tiles are made on the job, and the mixer and its crew are therefore kept busy at a steady pace without slack periods.

The windows generally employed are all metal and are secured in place during pouring. Wooden flooring, mouldings, etc., are taken care of in the usual manner by the inclusion of wooden strips or with nailcrete. Because of the many advantages of this type of construction, and the fact that it is comparable in cost to frame, it is believed that its use will become widespread. The system is patented.



Here is an isometric drawing of a foundation with tiles in place.

At right, a wall of the tiles in place, with the forms set at top to receive poured rim. Note soil pipe projecting above the tiles.



1926
DORMER WINDOWS
SHUTTERS AND BLINDS

1927
ENGLISH PANELLING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928
BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929
DOORWAY LIGHTING
ENGLISH FIREPLACES
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

1930
SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS

1931
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS
ALTARS
GARAGE DOORS
MAIL-CHUTE BOXES
WEATHER-VANES
BANK ENTRANCES
URNS
WINDOW GRILLES
CHINA CUPBOARDS
PARAPETS

1932
RADIATOR ENCLOSURES
INTERIOR CLOCKS
OUTSIDE STAIRWAYS

THE SIXTY-SIXTH IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS

ARCHITECTURE'S PORTFOLIO OF

LEADED GLASS MEDALLIONS

Subjects of Previous Portfolios Are Listed at Left

Forthcoming Portfolios will be devoted to the following subjects: Exterior Doors (May), Metal Fences (June), Hanging Signs (July), Wood Ceilings (August), Marquises (September), and Wall Sheathing (October). Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up about six weeks in advance of publication date.

Henry D. Dagit & Sons, architects

Designed and executed by Charles J. Connick
Charles F. Cellarius, architect

Designed and executed by Charles J. Connick
Charles F. Cellarius, architect

Designed and executed by Henry Lee Willet

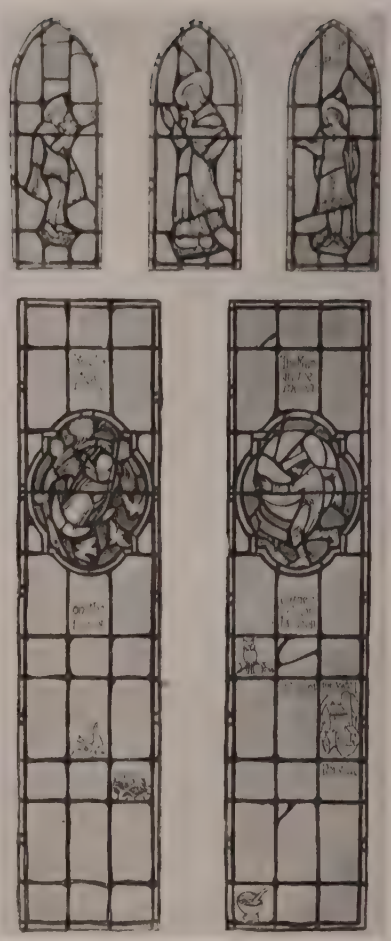
Designed and executed by Charles J. Connick
Charles F. Cellarius, architect

Henry D. Dagit & Sons, architects

Designed and executed by Henry Lee Willett

Designed and executed by Charles J. Connick
Charles F. Cellarius, architect

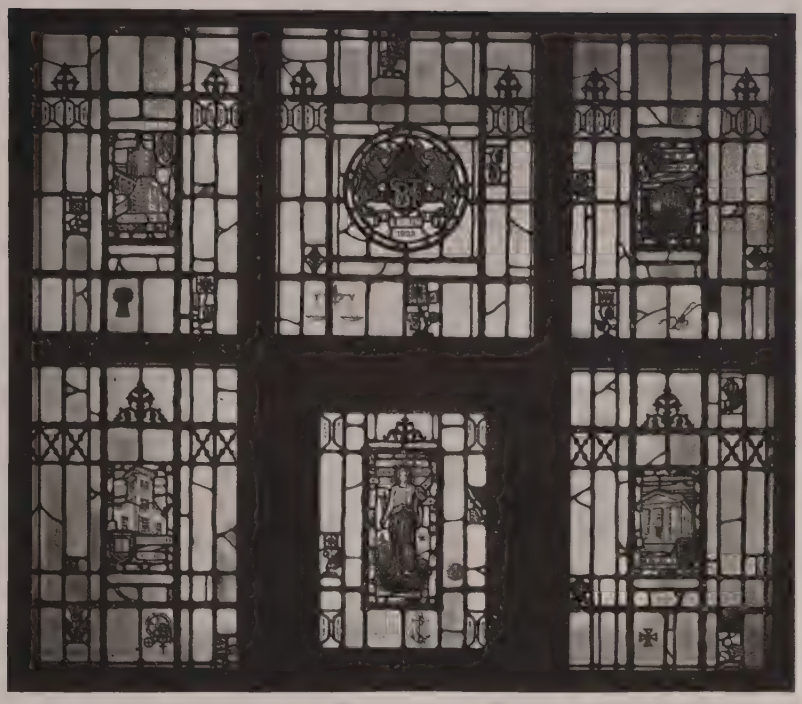
William W. Price, architect



Designed and executed by Charles J. Connick
Stanley Matthews, architect

Below at right, designed and executed by G. Owen Bonawit, Inc.
Childs & Smith, architects

Designed and executed by The Linden Company
Childs & Smith, architects



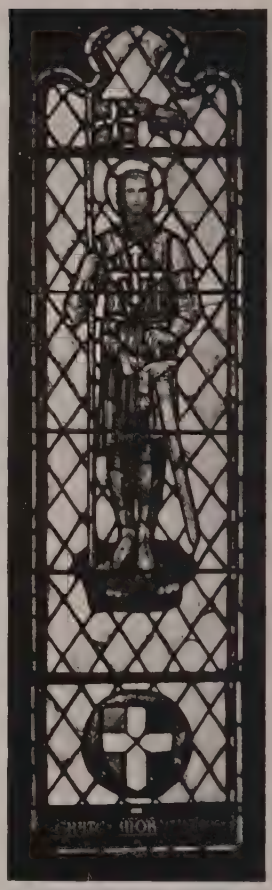
Designed and executed by The Linden Company
Childs & Smith, architects

Designed and executed by Charles J. Connick
Stanley Matthews, architect

Below at left, designed and executed by The Linden Company
Childs & Smith, architects

Executed by Clement Heaton
Frederick L. Ackerman, architect

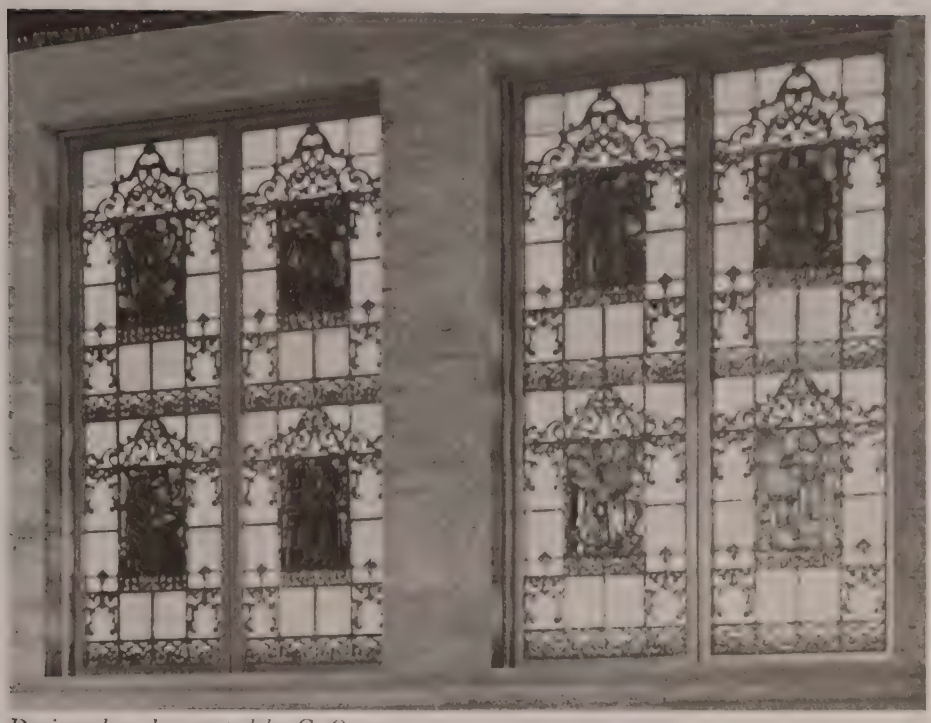
Wesley S. Bessell, architect



Designed and executed by
Charles J. Connick
Cram & Ferguson, architects

Designed and executed by The D'Ascenzo Studios

Designed and executed by The D'Ascenzo Studios

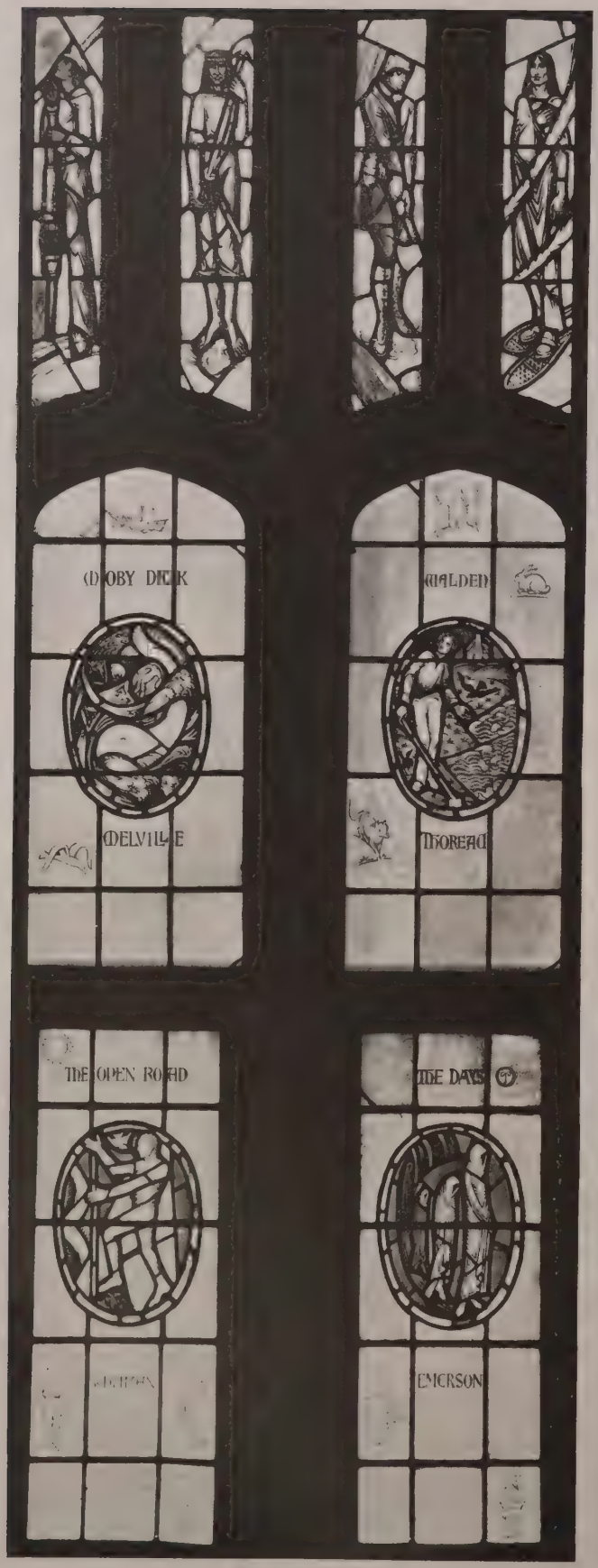


Designed and executed by G. Owen Bonawit, Inc. Childs & Smith, architects

Designed and executed by Charles J. Connick Cram & Ferguson, architects

Henry Raeder, architect; N. Max Dunning, George C. Nimmons & Co., associate architects

Designed and executed by Charles J. Connick

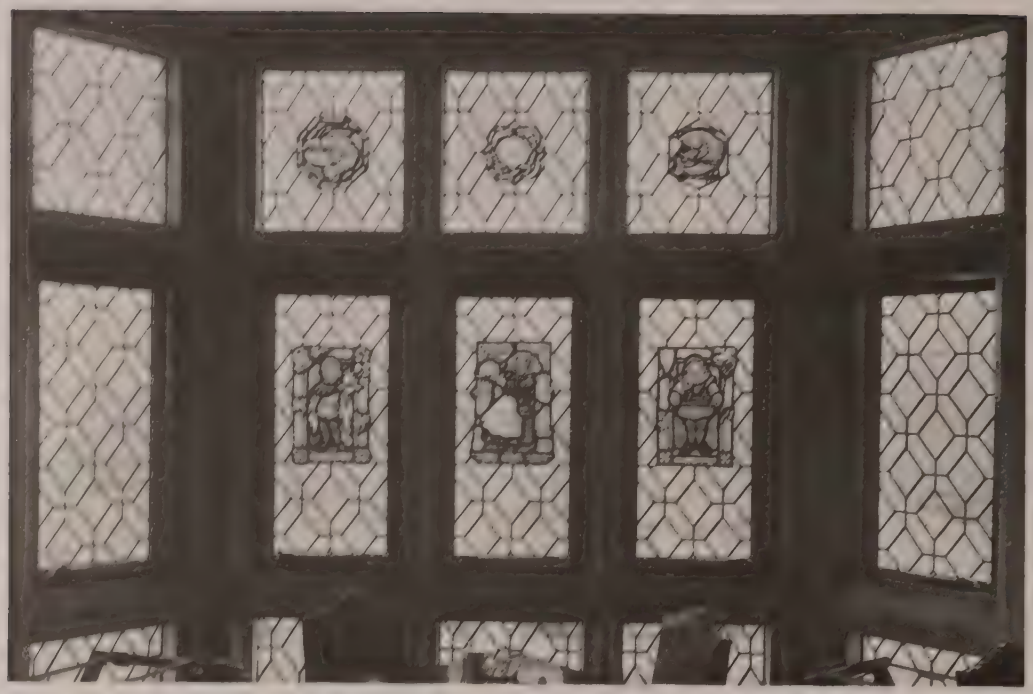


Executed by The Linden Company
Childs & Smith, architects

Designed and executed by Charles J. Connick
Granger & Bollenbacher, architects

Executed by The Linden Company
Childs & Smith, architects

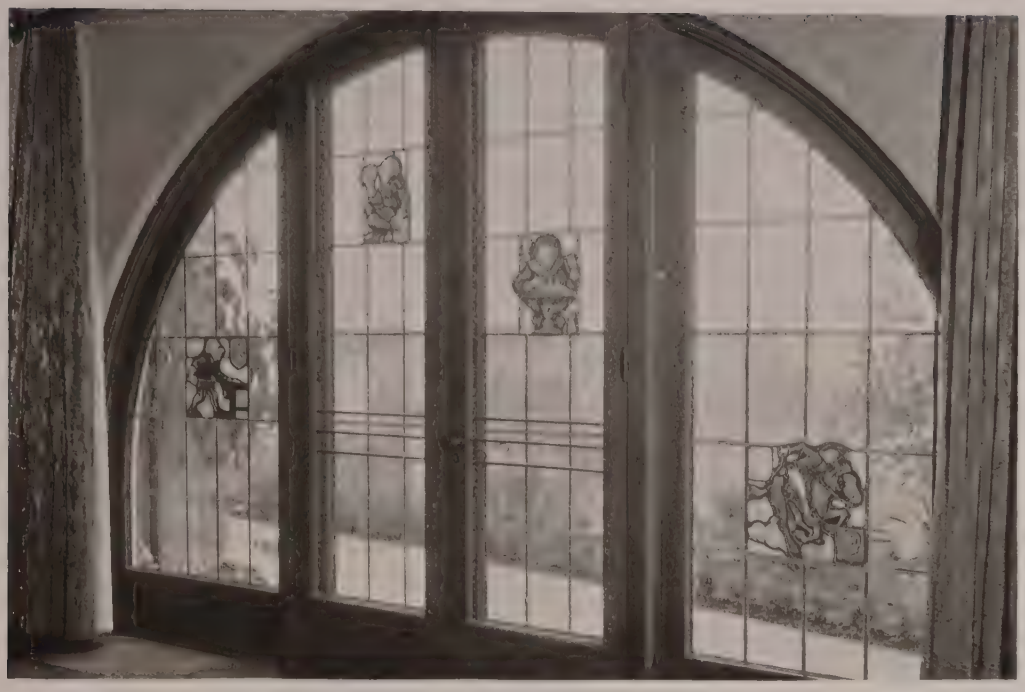
Designed and executed by Charles J. Connick
Granger & Bollenbacher, architects



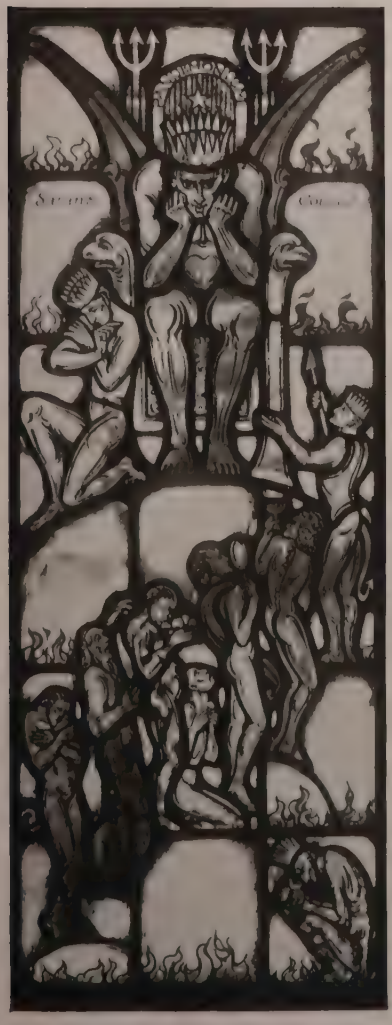
Allison & Allison, architects

Designed and executed by Henry Lee Willet

Paul R. Williams, architect



Designed and executed by Henry Lee Willet



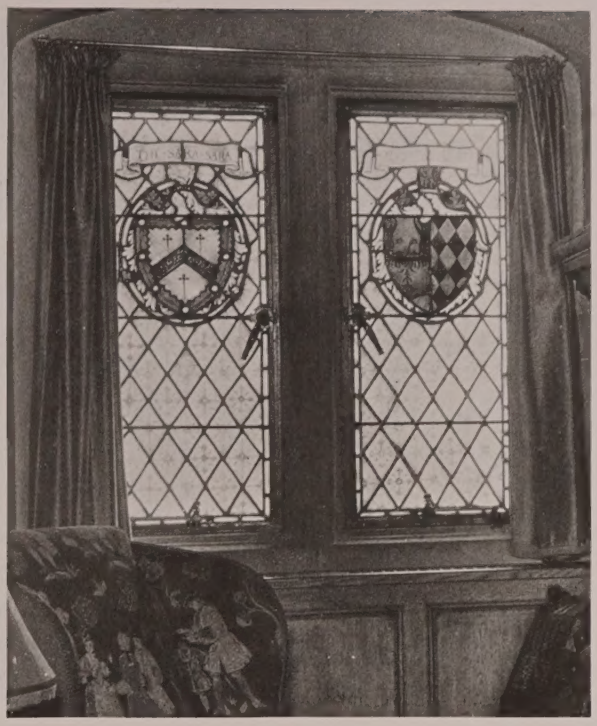
Designed and executed by The D'Ascenzo Studios
Paul P. Cret, architect

Designed and executed by G. Owen Bonawit, Inc.
James Gamble Rogers, architect

Louis Hessler, decorator

Designed and executed by The Linden Company
Childs & Smith, architects

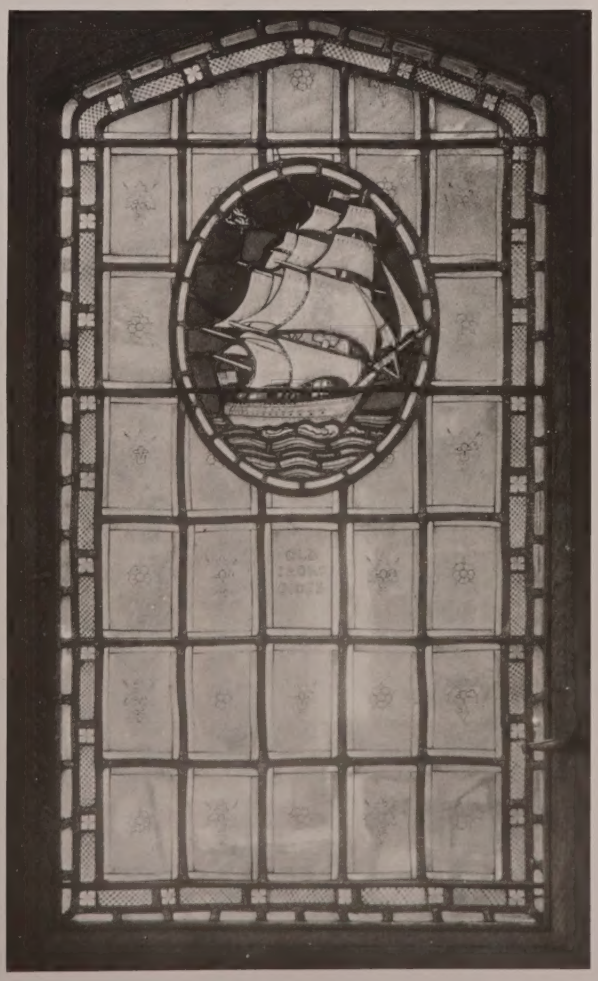
Benjamin V. White, architect



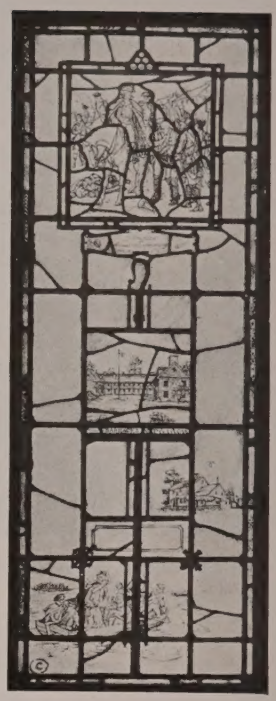
Executed by Clement Heaton
Frederick L. Ackerman, architect

Executed by Clement Heaton
Frederick L. Ackerman, architect

Paul R. Williams, architect

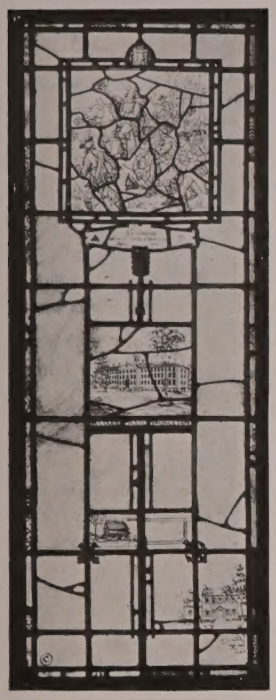


Designed and executed by Charles J. Connick Cram & Ferguson, architects



Designed and executed by The D'Ascenzo Studios

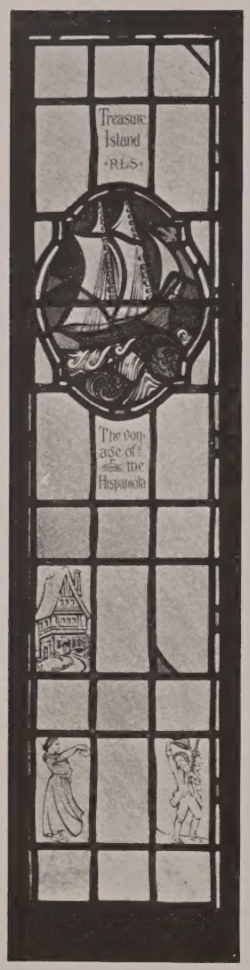
Below, three panels, designed and executed by Charles J. Connick Granger & Bollenbacher, architects

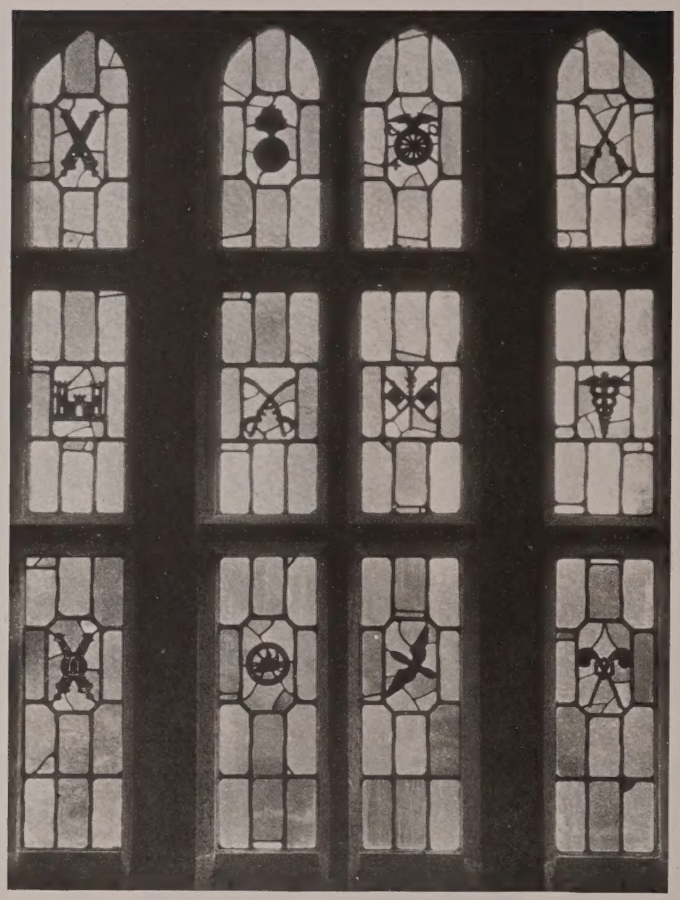


Designed and executed by The D'Ascenzo Studios

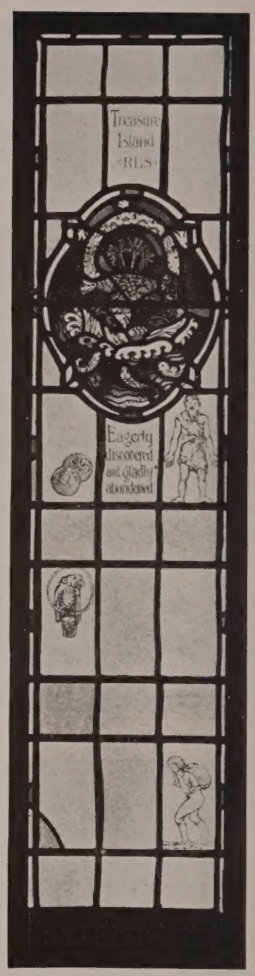
Executed by Mary Hamilton Fry Roger H. Bullard, architect

Below, three panels, designed and executed by Charles J. Connick Granger & Bollenbacher, architects





Walter T. Karcher & Livingston Smith, architects



Flanking panels above, designed and executed by Charles J. Connick. Stanley Matthews, architect

Executed by Mary Hamilton Fry
Roger H. Bullard, architect

Designed and executed by
The D'Ascenzo Studios
Edward Buehler Delk
architect

Executed by
Mary Hamilton Fry
Roger H. Bullard
architect